

COMPUTERWORLD

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User-Oriented Terminal Standards Urged

By Drake Lundell
CW New York Bureau

GAITHERSBURG, Md. — Keyboards and terminals should be designed to make life easier for the user and not for the manufacturer, Dr. T.A. Dolotta, president of Princeton Time-Sharing Services, told the ACM workshop on terminals and keyboards here last week.

The workshop, sponsored by

the ACM and hosted by the National Bureau of Standards, was designed to pinpoint problems in the terminals area. The conclusions, and possible solutions, will be presented at the 1970 ACM National Conference in New York City in September.

Keyboard and terminal manufacturers, Dolotta said, know very little about the needs and problems faced by the terminal

user, and in the past, the man has had to adapt to the machine.

A proposal to subsidize participation of computer users in Ansi activities . . . Page 4

The manufacturers should reverse this trend and begin building machines that are more human oriented, he said.

The user, according to Dolotta, is not interested in how a ma-

chine works, but is interested in cost and whether or not it does what the manufacturer says it does. The user is not interested in standards, he said, unless they restrict his operation.

Most terminals — and terminal standards — have been developed for use by telegraphers, not untrained people, Dolotta said. All of the symbols and design of keyboards have been built to

concepts formulated by and for telegraphers trained in their profession.

With terminals taking the place of most other inputs to computer systems today, they are being operated more and more by untrained personnel who do not have the time to learn all of the traditional communications terminology and functions, he added.

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SJCC Convention Center

Business-Oriented Minis One of SJCC's Highlights

By Edward J. Bride
CW Staff Writer

ATLANTIC CITY, N.J. — The 36th semi-annual Spring Joint Computer Conference (SJCC) is expected to witness more new products, new services, new faces, and new ideas exposed to the public than ever before.

It will also be a show of firsts. The new breed of minicomputer is expected to be in the limelight, as more uses and users become evident in Atlantic

City's Convention Center.

Before it's all over, 40,000 people are expected to attend, and one way or another, they will all be affected by the minis.

CW's coverage of the SJCC exhibits began in last week's issue and is continued on Page 31 of this week's issue.

Other firsts will be in evidence. A youthful science group will hold an independent technical session, with a quasi-blessing from the conference sponsor, the American Federation of Information Processing Societies (AFIPS).

It is believed the group is breaking conference precedent with a cash award for the best of its students papers.

A foreign, company, ICL will display OEM peripherals. Some U.S. companies won't exhibit because they are having trouble selling, or justifying spending all that valuable hardware just for show.

And the older generation gets together for a reunion.

Escalate Mini-Maxi Battle?

Those marketing experts who predicted that the mini-maxi battle in the fashion world would escalate into the computer world may be right.

The big interest among users at this year's SJCC may very well be the new wave of under-\$15,000 minicomputers.

The big secret of this new machine, said one research expert, is that the microprogramming—the instruction set—is programmable or alterable to fit the needs of the user.

A machine can be ideally suited for communications processing, and then be quickly switched to be ideally suited for large-scale data management.

The youthful Resistors (Radically Emphatic Students Interested in Science, Technology, and Other Research Studies) are

(Continued on Page 4)

Computer, Microfilm Technologies Must Merge, COM Users Agree

By Phyllis Huggins
CW West Coast Bureau

SAN FRANCISCO — The marriage of computer systems with microfilm storage and information retrieval is essential to avoid being drowned in a sea of paperwork, according to a consensus at the National Microfilm Association (NMA) Conference last week.

The theme of "paper pollution" created by computer-generated systems was emphasized repeatedly in the sessions and suites where the COM professionals gathered.

The conference agreed that the goal was to elicit from the systems only the information de-

sired and to disseminate it as quickly as possible.

At the COM users' meeting, emphasis was on creating some type of standardization since each manufacturer prefers to go his own way.

Communication was also cited as an important need. As one user put it, "Little is documented now because most people are still in the planning stages; however, some high technology-oriented companies are way ahead of the others and their experience would be most valuable if it was shared."

NMA is starting a documentation center as a focal point for COM. It may eventually set up a users' group within the association.

Applications Oriented

According to Peter R. Scott, MIT, program chairman, the difference in this year's conference program and others is that previous concern focused on how to get the technology implemented. This year the program is almost entirely applications oriented. "We are now talking about how to put the existing technology to work," he said.

Parallel seminars were held in the areas of medical and hospital uses, computer-assisted instruc-

tion, government operations, banking, insurance industry, library uses, engineering drawings and retrieval, scientific world use, and micropublishing systems.

NMA estimates the annual (Continued on Page 4)

Judge Rules Army Can 'Collect,' 'Circulate' Data on Dissenters

By Joseph Hanlon
CW Staff Writer

WASHINGTON — The Army has the right to "collect, store, and circulate" information on lawful political activities of civilian dissenters, a federal judge has ruled.

Meanwhile, the Army has announced the elimination of another computer-aided data bank and has clarified its previous announcements on computerized data banks.

In dismissing the American Civil Liberties Union (ACLU) suit, U.S. District Judge George L. Hart Jr. declared that the Army was not "doing anything newspapers are not doing... keeping information in their morgues."

But an ACLU spokesman argued that there is a significant difference between newspaper files "and a computer capable of producing detailed printouts on political activity and beliefs of individuals and organizations."

'Newspapers Don't Have Guns'

"Newspapers don't have guns and don't have jails," declared ACLU counsel Frank Askin. "Nobody is afraid that someday the news services are going to sweep into town and arrest the troublemakers."

In its suit, the ACLU charged that the Army has no legal right to engage in surveillance of lawful activity and distribute such information, and that the Army's actions produce a "chilling

effect" on the constitutional right to free speech. "No one wants to feel that the Army is keeping track of him," Askin said.

But Hart dismissed most of the ACLU arguments as "ridiculous" and denied the ACLU request for an injunction against the Army. The ACLU has appealed to the U.S. Court of Appeals.

Judge Won't Allow Witnesses

The ACLU attempted to present witnesses in an effort to show how the Army's data collection differed from that of a newspaper, but Hart refused to let them testify. He said that their testimony should have been presented in advance in the form of affidavits.

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Computers Reliable

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Bankers Warned of Dangers From Bill Limiting DP Field

By Phyllis Huggins
CW West Coast Bureau

SAN FRANCISCO — Bankers at the American Bankers Association (A.B.A.) National Conference on Automation were warned that pending legislation on bank data processing activities "might freeze us out of the opportunity to grow, to prosper, and to save the economy."

John J. Balles, senior vice-president, Mellon National Bank and Trust Co., Pittsburgh, Pa., a member of A.B.A.'s Federal Legislative Committee and the Special Committee on One-Bank

Holding Companies, also said: "It remains to be seen how many data processing programs will be threatened by the pending legislation and litigation which could strike at the heart of financial consulting services in the bank-customer relationship."

Last November, the House of Representatives passed H.R. 6778 — a highly restrictive bill affecting one-bank holding companies and all banks indirectly. This bill was rewritten from one drawn up the previous June and, according to Balles, was rewritten in a highly charged and diffused atmosphere.

It sets forth a "laundry list" of activities prohibited or severely limited to one-bank holding companies and their subsidiary banks, coupled with a strong statement of legislative intent

that the limitations of these activities should be applicable to all banks. The bill prohibits bank data processing activities except as incident to banking services such as preparation of payroll or to the extent necessary to make economic use of the equipment.

Balles said this bill could also lead to endless litigation to define the actual limitations.

New EDP Services

Under previous interpretation of banking restriction, banks have been able to expand into new EDP services to customers in payroll, account reconciliation, credit bank services, accounts receivable, freight payment plan, tax billing for municipalities, etc. In addition, highly advanced techniques based on computer programs for

fund management have been developed for corporate customers.

"As financial advisers and money managers for their customers, banks have pioneered in the application of computers to finance record-keeping function both for their own internal purposes as well as for the needs of your customers. To continue to perform successfully in the future, banks will need complete and unhampered use of computers and data processing services," Balles told the conference.

Also of importance is the Supreme Court decision that a member firm of Adapso has the right to sue the U.S. Comptroller of the Currency regarding his permitting of banks to engage in what Adapso considers non-

banking activities of an anti-competitive nature.

Presidential Commission

The third action under way in Washington is the appointment of the Presidential Commission on Financial Institutions. The A.B.A. felt that a serious and thoughtful study of the nation's financial system is essential to any legislation of the type pending.

Balles concluded: "It is no exaggeration to say that the future of banking will depend heavily on our ability to participate in the technological application of automation. Technological changes in this field may well constitute the principal area of change and development among financial institutions in coming years."

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Panel Stresses Terminal for User

(Continued from Page 1)

Because of this, the keyboard should be designed to allow the user to control the format and content of messages to be transmitted, he said, but should not control the communications link. The control of the communications link, he said, should be relegated to a separate part of the terminal separate from keyboards.

Standards in the field, he said, have all been developed to suit the manufacturers of terminal equipment, and the user has been ignored. Logical bit pairing on terminals and in terminal standards serves the manufacturer, but not the user, he said.

The standards developed in the past by Usasi (now Ansi) have

been primarily manufacturer-oriented, he said, because no provisions have been made for user participation on the working committees of the standardizing bodies.

In the future he said that "standards should become by the user and for the user," or at least "the people who build terminals and the people who build standards should get to know user needs and problems."

Claude Kagan of Western Electric underscored the need for more people-oriented standards by predicting that the cost of display terminals would fall to approximately \$50 to \$100 in the next five years, putting these terminals within the reach of the general public.

When the public becomes involved in the purchase and use of displays they will want — and get — optional features that are not covered by present display standards, he said, and the result could be chaos if action is not taken now, he added.

Another related problem caused by the proliferation of terminals and services that the terminals can be interconnected with is that of the user interaction with the computer interface, according to Calvin N. Mooers of Rockford Research Institute in Cambridge, Mass., and head of a working group of the ACM workshop on terminals and communication at the National Bureau of Standards.

Mooers said that the number of on-line terminals in the U.S. had jumped from around two in 1962 to at least 20,000 today and would probably be somewhere between 200,000 and 300,000 by 1972. In addition, he said that there would be around 15,000 computers linked to terminals by 1972, each with its own control procedures and with many different data formats.

Today, Mooers said, "the user is absolutely helpless unless he is thoroughly familiar with the particular keyboard rituals and incantations required to elicit performance from the specific remote machine. It is safe to estimate the knowledge of at least 30 to 40 different languages and rituals would now be required for operation" of the presently accessible services.

"If such proliferation continues, unchecked by any plan or guidance, it is predictable that by 1972 there will be hundreds, or more likely, thousands, of differing control methods and languages. If so, a substantial part of the automated information systems will have been needlessly destroyed."

To overcome the problems, Mooers suggested that 12 logically distinct control functions, "which are of crucial importance to the user when he enters an automated information system," should be developed and standardized so that a user could enter any system in operation.

Plan Would Subsidize User Participation in Ansi Functions

GAITHERSBURG, Md. — A proposal to subsidize participation of computer users in Ansi activities was made here last week by a working group of the ACM workshop on terminals and communication at the National Bureau of Standards.

The proposal, which was not adopted as a formal resolution but was referred for further discussion and debate, "deplored the low level" of interest in Ansi-sponsored activities due to the high cost of participation.

The group discussed methods of supporting user participation with particular emphasis on organizational backing. Groups such as the ACM or Afips, it said, could be logical candidates to support user representatives on Ansi activities.

Among the formal recommendations adopted was one calling for the "encouragement" of user participation in Ansi activities by the NBS.

The group suggested that the NBS support of user meetings on proposed standards would give the recommendations of such meetings a great deal of weight that could not be ignored by the standards body. The user, the group said, should "exercise and organize a critical voice on services and features of interactive services and terminals."

The user's voice on standards would be seriously considered in Ansi activities if that voice could be organized and pressed seriously through some formal organization, the group said. There is a need for more "consumerism" in the computer industry, the group declared.

In addition, Robert Berner of GE suggested that perhaps a tax on computer sales could be levied to support the whole range of computer standardization, including user participation. Federal support of standard activities, through the dedicated tax, could allow a wider participation and assure development of widely accepted standards.

Biggest DP Show on Earth Begins Run in Atlantic City

(Continued from Page 1)

here for their fourth conference, but they are making their own brand of history with a student technical session.

Suggested by Afips' Harry Cooke, chairman of the SJCC committee, the meeting was set for opening night and was to feature papers from the U.S. and Canada. A cash award of \$150 was to be made for the best paper—another first.

The award was donated by IBM to the group for travel expenses, but was not needed for that purpose.

Authors of selected papers ranged in age from 13 to 17. The presentation deadline was only two weeks ago, allowing for much more recent, and perhaps more topical, subjects than the six-month deadline Afips has for technical presentations.

Money Matters to Makers

At least three major manufacturers have decided that the joints are not worth the investment.

Control Data Corp., Burroughs, and RCA's EDP Division are not exhibiting because of the sizeable investment and what one firm called the "minimal return."

One of the three estimated that the cost of exhibiting would be "well over \$50,000," and the others indicated that the total cost, when personnel time and all other expenditures are fig-

ured, could run as high as \$100,000 for one show.

The non-exhibitors felt that more and more firms would be dropping out of the huge trade shows and entering the smaller specialized shows.

The figures from Afips do not indicate a trend in this direction. This year's SJCC will have 350 exhibitors occupying 960 booths, more than double the number of exhibitors in Boston last May.

There will be 18 fewer exhibitors than at the Fall Joint in Las Vegas last year, but comparisons are normally made between two years' spring conferences (East Coast), or fall conferences (West Coast), rather than between the shows only six months apart.

At least one company will be presenting its special solution to measurement problems—the locating and detailing of operational inefficiencies in programs and computer systems.

Computer Management Aids Corp. will be introducing its Systematically Improved Throughput Service (Sits), which consists of a two-day examination of the throughput relationships of an installation's major programs.

Afips management hopes the better traffic and telephone situations will stand up to avoid the major problems of last year's Spring and Fall Joint Computer Conferences.

Which would also make history.

COM Users Affirm Need to Merge Computer, Microfilm Technologies

(Continued from Page 1)

growth of the microfilm industry at 18% a year with an estimated \$300 million to \$500 million annual business in conventional microfilm. "However," according to Karl Adams Jr., NMA president, "the magic word is COM. COM hardware manufacturers jumped from five to more than 35 and COM service companies from 10 to more than 100 in one year."

"With estimates indicating growth in the COM field from today's \$100 million for equipment and film to over a billion dollars in five years, we have a tiger by the tail," he said.

Minnesota Mining and Manufacturing Co., along with Kodak, the dominant company in microfilm work, cited the automobile manufacturer which had a full-sized computer installation working as nothing but a batch-processing printer to maintain its

warranty files. The cost was \$300,000 a year. A COM system replaced the computer system, and the cost dropped to \$38,000 a year.

A.L. Fenaughty, president of Information International, said a graph plotter would take eight hours to do a large aircraft design, but a COM unit, such as his FR-80, could do it in seconds photographically. He also said that a user can normally figure a 98% reduction in storage space when files are converted to COM.

He said he thought it would take five years before the two technologies of microfilm and computers merged comfortably.

He said microfilm retrieval and presentation could be done for about 20% of the cost of presenting information on paper.

An estimated 12,000 people attended the conference and there were 90 exhibitors.



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DATES & LOCATIONS: (9:00 to 12:00 A.M.)

Seattle	May 19	Pittsburgh	May 28
Los Angeles	May 20	Washington, D.C.	June 2
Houston	May 21	Boston	June 3
Atlanta	May 22	New York City	June 4
Detroit	May 25	Montreal	June 5
Chicago	May 26	New Orleans	June 12

SCI SYNERGISTIC
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Judge Rules for Army In Data Collection Suit

(Continued from Page 1)

According to the ACLU, Army Intelligence infiltrates a broad range of political and non-political groups. An Army Intelligence officer was resident at Resurrection City in Washington in 1968, and two agents were assigned seats at the 1968 Democratic National Convention, the ACLU said.

One former Army Intelligence officer was prepared to testify that he infiltrated a totally non-political group made up of church clubs, the Young Democrats, and a ski club. The Army also had an informer in the group, he said.

One man said that while stationed at Ft. Carson, Colo., he was ordered by his colonel to infiltrate the Colorado Springs group, Youth Action Project, because its leader had once picketed Fort Carson and had been a member of SDS.

Also slated to testify was Ralph Stein, who said that he set up the New Left desk of the Counter-Intelligence Analysis Division (Ciad) at the Pentagon. He reported that he had access to the Ciad's computer-indexed microfilmed data bank which contained information on 3,000 to 5,000 civilians and over 300 organizations.

Two of Three Destroyed

Meanwhile, the Army has released new information on its computerized and computer-aided data banks of civilian political activity, and it is now possible to present a relatively up-to-date picture of them:

- Civil Disturbance Incident Reports — The largest and only fully computerized data bank and the first to receive general publicity. The data bank has been destroyed, which means, according to an Army spokesman, that all hard copy and all tapes erased. One copy of the complete printout remains for use in connection with the ACLU suit, but the data will not be transferred to other agencies, and the printout will be destroyed after the suit is settled.

- Ciad Data Bank — A microfilm data bank in the Pentagon, with "limited files concerning civilian activity," according to Thaddeus R. Beal, Under Secretary of the Army. Files "are not computerized, nor is there any plan to do so," according to Beal. But the index is computerized.

- Continental Army Command, Ft. Monroe, Va. — A smaller version of the Ciad data bank. Steven Sackes, in the office of the General Counsel of the Army, told CW that there is no data bank now at Ft. Monroe,

but refused to say if there had been one or when it had been discontinued. Since other sources indicate such a data bank existed, it is believed that this is the second data bank referred to in Army Secretary Stanley Resor's March 6 letter [CW, April 8]. There is no information on what has happened to the data.

Other non-computerized data banks containing information on lawful civilian political activity are apparently maintained by eight Military Intelligence (MI) Group headquarters, local MI offices, and six Army command headquarters. Data collection is continuing as before, and the Ciad data bank may be making up for the discontinued data banks.

MI offices are still filing spot reports on "incidents." These reports go to all military posts, the Ciad and other intelligence offices, and the Justice Department. Spot reports are destroyed after 60 days, which means that original spot reports put into the Fort Holabird data bank have now been destroyed. But summaries of these reports are not destroyed, which means that much of the information is still on file in local MI offices.

Furthermore, Ciad and the Justice Department have received all of the spot reports, and have added to their data banks any reports they consider relevant.

Checked Julian Bond

While it was in operation, the Fort Holabird data bank could be used to provide dossiers on a wide range of people. One former member of Military Intelligence told CW that he had used the Holabird data bank to get a dossier on Julian Bond, the black Georgia legislator.

But most of what he wanted was in Ciad, he said, and he rarely used Holabird. The Ciad data bank is generally sufficient for compiling dossiers, he noted.

The Ciad data bank is based primarily on FBI reports, supplemented by newspaper clippings and Army Intelligence reports. Each desk head, such as the New Left desk head, selects the information he wants to enter into the data bank.

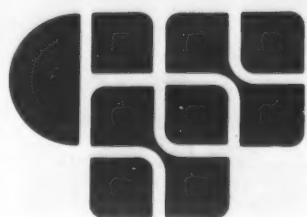
For example, the FBI circulated mimeographed investigation reports on all 600 persons arrested at the 1967 antiwar demonstrations at the Pentagon. Ciad received all 600 reports, and entered about 150 into its data bank.

Items included in the data bank are put on microfilm, and a card is punched to give its microfilm location. Once a month, an alphabetical index is printed. The index contains a code number describing the individual or group. For example: 135.799 is a Communist front peace group, 134.799 is a non-Communist peace group.

Persons and organizations listed in the Ciad data bank include a right-wing Baptist minister who writes anti-Semitic letters, a labor union, the wife of the late Dr. Martin Luther King, and various groups opposed to U.S. involvement in Vietnam.

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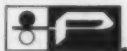
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MCI Prepares for Microwave Operation Despite Opposition of Common Carriers

By Ronald A. Frank

CW Technical News Editor

WASHINGTON, D.C. — Despite continuing opposition from existing common carriers, Microwave Communications Inc. (MCI) expects to begin operation of its Chicago-St. Louis link Sept. 11.

The inauguration of the microwave service will mark the first time that a special service common carrier such as MCI has competed with existing common carriers in providing data communications facilities over similar routes. The link was approved last August by the FCC.

In commenting on various motions for reconsideration and other delaying actions currently being waged by the carriers to forestall the operation, John Goeken, MCI president, told CW that more than 400 channels of a total capability of 1,800 had already been subscribed by data communications users.

Goeken said that the Bell System in some of its arguments is taking a position completely reversed from its original objections. He cited the current posi-

tion that MCI will provide unfair competition as being completely different from Bell's original claim that his microwave firm did not have sufficient resources to supply communications services to computer data users.

Communications

Goeken said that MCI has attempted to work with Bell companies to plan microwave tower sites. He said that because the original Chicago to St. Louis route approved by the FCC paralleled Bell facilities, MCI modified some tower locations "to allow Bell room for future expansion." He said that the carriers (Bell and Western Union) had cited these modifications as evidence that MCI did not have its technical details finalized.

Since each of the modifications had to be filed and approved by the FCC, the carriers attempted to show that the tower modifications would delay operation of the new service. Western Union last week argued that MCI's

Chicago-St. Louis microwave service "is a long way from becoming a reality." The carriers also said that the tower changes meant MCI would serve new market areas.

Goeken said that the proposed modifications were strictly technical in nature and in no way affected the overall operation of the data link or its starting date.

"If we move our tower sites a 1/2 mile for technical considerations, these matters should be worked out between the carriers and our firm without wasting the commission's time," he added.

Goeken said that testimony by witnesses before the FCC had shown that the Bell System might actually gain additional revenue from competition with MCI. He said that most data users had told the commission that although their communications budgets were limited, their data needs had not been met. Goeken said that it was probable that money saved through the use of MCI facilities, would be committed to obtaining additional service from Bell.

CPI Files for Control of Texas Carrier

WASHINGTON, D.C. — Communications Properties, Inc. (CPI) has filed with the Federal

Modem Tester Synchronous, Asynchronous

NASHUA, N.H. — A pre-set, bit-count modem tester for determining error rates on asynchronous modems to 240 bit/sec and synchronous modems to 200,000 bit/sec is being offered by Sanders Associates, Inc.

Called the Model 101, the modem test set is designed for local and remote looped, full-duplex modems, and provides one-way transmission or reception for half-duplex or simplex modem testing and is compatible with RS 232B interfaced modems.

The device features self test, overcount indication, error injection, and output jacks for signal analysis. The modem test set generates all mark, space alternate mark/space, 7-bit cyclic and pre-set duration, and continuous 2,047-bit pseudo-random test patterns, the company said.

The Model 1010 provides direct readout of errors against a pre-set, bit-count duration, reportedly eliminating timed-rate mathematics.

The Model 101 modem test set is priced at about \$1,500 and is available on a 60- to 90-day delivery.

Sanders Associates, Inc. is located on Daniel Webster Highway, South.

Communications Commission for permission to assume control over West Texas Microwave Co. and expand it into a full data transmission system.

Permission to build a common-carrier, data-transmission system would give Communications Properties, Inc. a common carrier microwave complex serving more than 90% of the Texas population, the company said.

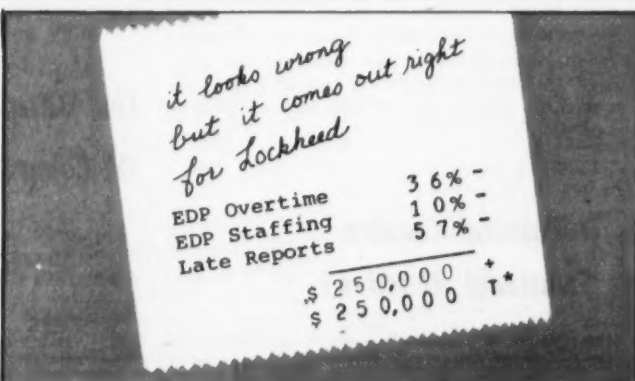
If operated as WTM Microwave, Inc., a wholly owned subsidiary, the common carrier now serving 29 community antenna television systems in Texas, would be converted from a system which requires one-way

capacity equipment to a system which requires a simultaneous two-way capacity.

"We see this as a unique opportunity for Communications Properties to take advantage of the burgeoning data transmission industry," said Jack R. Crosby, president.

Conversion of the system will be done on a section-by-section basis. Crosby estimated the first link, between Dallas and Ft. Worth and the Midland and Odessa area, could be completed a year after the FCC permission.

The entire system will take about two years to install and cost some \$5 million, the company said.



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announcing

■ datamate 70:

the Skinny Mini

The Computer Fashion Show in Atlantic City this spring is in for a jolt. The Skinny Mini has arrived from Big Spring, Texas, and will be modeled in booth 1304-5 of the SJCC. Fashions in computers will never be the same again—Datamate 70 with its less than two inch profile serves notice that it's changing the appearance of all mini computers. Permanently.

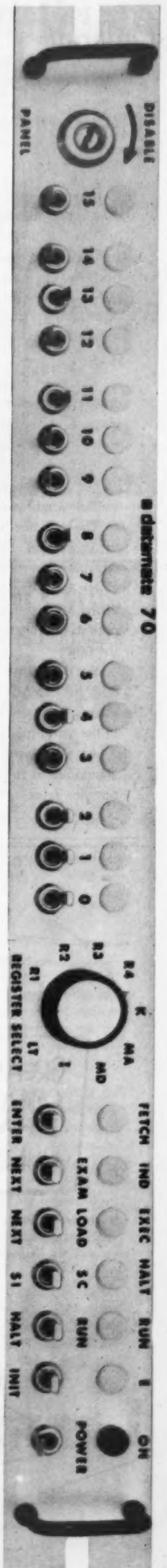
Just look at what we've crammed into a cabinet 19" x 20" x 1 3/4" high! Datamate 70 is a 1 microsecond, parallel 16-bit digital computer with up to 1024 words of ROM. An optional configuration provides up to 16K of core memory, with an additional capability of expansion to 32K. And even then, it's only 8 3/4" high.

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Editorials

Minis Come of Age

Late last year we expressed dismay — even annoyance — that minicomputer designers were displaying so little interest in producing business-oriented systems.

Minis were "general purpose" only in the sense that they weren't permanently programmed. They were so relatively difficult to program that most users installed them only for single-purpose applications.

Now the picture has changed radically — and we're delighted.

The new minicomputers and microcomputers show drastic changes in design that make them truly general purpose. They are byte-oriented machines with user-variable microprogramming, better software, and a wide choice of peripherals.

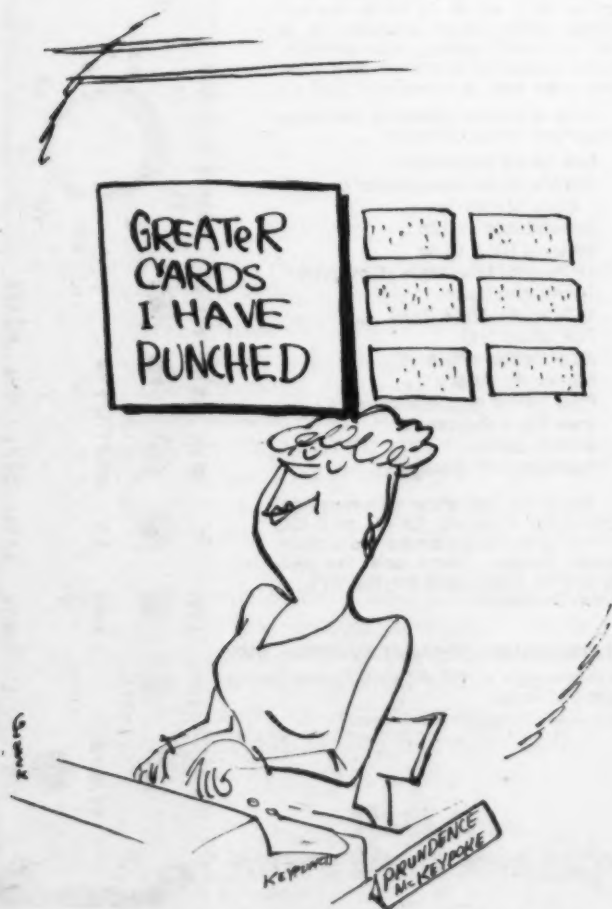
For the first time, they offer a reasonable alternative to "full-sized" systems.

The user now can decide whether it is most efficient to implement his applications on one or two large systems or on many small systems.

He can even use a mixture, with the mini systems acting as preprocessors for the large systems during peak periods and operating as stand-alone systems the rest of the time.

We don't take credit for the new systems (they were obviously already well into the design phase at the time we criticized the situation), but we welcome their arrival in the marketplace.

After all, the name of the game from the user's standpoint is to be able to suit the system to the need, not vice versa.



Something for Everyone



Letters to the Editor

'Unlawful Purposes' And the FCC Decision

With respect to your editorial of April 15 ["Passing the Buck"], I believe it only fair that you call to the attention of your readers not only the provisions of paragraph 12 of the FCC's tentative decision, but also paragraph 13 in which the commission states that it "does have a fixed and continuing responsibility with respect to the privacy and integrity of intelligence traversing the communications networks of this country, as well as with the possible use of such facilities for unlawful purposes... We intend to give further consideration to the needs which may exist in this area and to the regulatory actions which may be required."

Robert P. Bigelow

Boston, Mass.

The "privacy" mentioned in paragraph 12 applies only to interception by an unauthorized third party. "Unlawful purposes" is currently meaningless since no laws to regulate data banks have been passed. Ed.

Is It Political Concern Or Emotional Reaction?

Stan Myers' letter [CW, March 4] seems to overlook the fact that it is wholly inappropriate, in this society, to act against a private business based on an opinion about government policy. Political concern should manifest itself as political action, not a private vendetta against a participant who is not a policymaker.

Letters to public officials, formation of organizations, "citizen lobbying," active support of candidates, etc. can work for a goal within the legal framework of the system. Also, the destruction of equipment and records is in clear violation of the constitutional provision against deprivation without due process of law, in addition to more specific laws dealing with vandalism, etc. This provision must be upheld since it can be a major bulwark against government abuse of power against the private citizen.

I wish more persons of influence would carefully consider consequences before acting. "Like begets like," stated by Lao Tse, is a most important truism.

These facts are especially meet for the DP community, now developing a political consciousness as a segment of society, to bear in mind. Constructive political activity is essential, and destructive emotional reaction unconscionable.

Charles H. Collins, Jr.
Systems Engineer

Data Trends, Inc.
Parsippany, N.J.

Satire in 'Poor Taste'

Phyllis Huggins' satirical article "Beware of Computer Users Silent Majority" in the April 15 issue was in poor taste.

N. Snow

Comed Inc.
Oak Brook, Ill.

The 'Silent Majority' Of Computer Users Lives

The only comment that can be made about Phyllis Huggins' article entitled "Beware of Computer Users Silent Majority" is "Amen, Brother — Amen!"

N.E. Rofinot
Systems and Programming Mgr.

Massey-Ferguson Inc.
Racine, Wis.

ASI Deserves Equal Credit For Developing Score III

Thank you for your article describing the Score III system. However, the fact is that PMI and ASI are equal developers of the present Score III system. It is only fair and reasonable that ASI's very talented and dedicated technical staff be given the equal credit they deserve.

Robert P. Wolk
Vice-President, Marketing

Atlantic Software Inc.
Philadelphia, Pa.

New Firm Changes the High Performance Tape Game

It is not often that a single announcement of a new product can change the outlook in the computer industry. It is even less often that it can do so when the announcement is made by a firm that no one has ever heard of. So when that apparently happened,

The Taylor Report by Alan Taylor



a couple of weeks ago, I thought it was well worthwhile spending the time to go and check matters out for you. After all, it could have been a half-baked announcement. It wasn't.

PE Tapes From STC

The announcement was about some new high performance tape drives. These are the systems that work from 90,000 byte/sec up through 320,000 byte/sec. Normally they use pulse encoding (PE) and for practical purposes they have been available only from IBM in the past.

The firm was Storage Technology Corp. (STC), which is in Boulder, Colo. The attraction of the announcement was that it appeared to suggest that the firm both had technical capability in this highly sophisticated area, and was determined to try to bring both the price of the units down and also to improve the usefulness of them for the user installation.

The key importance was of course in the second part — increasing the usefulness of PE

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

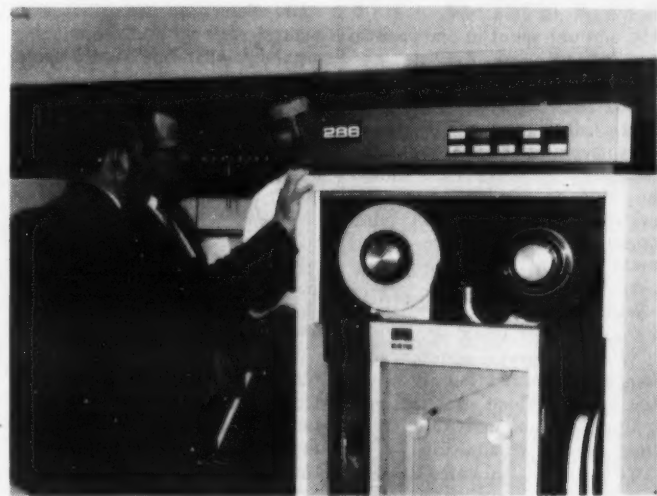
tapes. That is what the name of the game is. Reducing the price helps but, as someone once said, anyone can always make something a little bit cheaper by doing it a little bit dirtier, so price by itself is not too exciting.

From the technical side I personally had met only one of the people before, Thomas Kavanaugh. Tom had explained the features of the IBM high-speed drives to me at a computer conference earlier. But the credentials of the other former IBM people were pretty well unassailable: former manager of the Magnetic Testing Laboratory, former head of the advanced tape drive department, former superintendent of tape system manufacturing, etc. Lots of high powered sophisticated people were there. This certainly did not look like a "me-too" aimed simply at saving a couple of dollars.

Nor, when I got to Boulder, was it. It might have looked like this when five people got around a kitchen table last August and decided to start a firm. But in April when I was there, the STC high-speed tape drives were working — and the basis of many of the claims of increased flexibility was already there!

Increased flexibility is very im-

portant in this area because it changes the systems equations. Currently, the use of PE tapes is almost as separated from the use of the standard lower performance tapes as that of disk drives are! Installations with the PE tapes find that they often have to maintain two libraries, one for the standard 2400s and one for use on the PE drives. This means that PE is hard to get into.



Tom Kavanaugh, behind the first STC 2470, explains the specialized servicing facilities being built into the unit.

portant in this area because it changes the systems equations. Currently, the use of PE tapes is almost as separated from the use of the standard lower performance tapes as that of disk drives are! Installations with the PE tapes find that they often have to maintain two libraries, one for the standard 2400s and one for use on the PE drives. This means that PE is hard to get into.

Moving tape reels between PE and non-PE drives is also awkward. Moreover, recently it has been found that the amplitude of recordings under PE systems varies so widely from drive to

drive that some of the most advanced tapes currently on the market cannot be used unless the drives concerned are specially altered and then dedicated to the tape concerned. Altogether it is not a straight forward matter at all to get that extra performance.

And so looking at the tape systems being offered by Storage Technology Corp. it was delightful to find that they did not need anything like the same special handling. The same tapes can be used both on the medium performance drives and on the STC ones. This means that users have an easy transition which actually goes all the way from 7-track use to 9-track, to the PE tapes. Any of the standard tapes available on the market can be used. This again helps the user. And it is a real and immediate help.

But the matter is not restricted to the STC tape drives, either. Although those are all that currently exist, there is also a tape controller under development.

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Juan A. Rodriguez, STC's manager of technology, explains the programs of compatibility involved in amplitude variations on PE tape to Alan Taylor at the pilot production plant.

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Business-Oriented Minis Attract Users With Lower Prices, Functional Hardware

By Peter L. Briggs
CW Research Editor

With the introduction of minicomputers that have either a programmable micro-instruction set, or with predesigned microprograms that simplify the process of data handling and report generation, minicomputer manufacturers are showing real signs of responding to the needs of businessmen.

MicroSystems has announced minicomputers that sell for under \$10,000 and have completely programmable micro-instruction sets. Of course, the IBM 360/25 has had this capability since its announcement, but it has been little used, probably because IBM has de-emphasized this particular func-

tion.

Atron Corp. has announced its Datamanager, a \$6,000 minicomputer that will handle data in terms of strings and records, rather than multiples of words as do pseudo-scientific minicomputers [CW, Dec. 3].

It appears that the results of several months of research and development are now appearing on the user market. Last December, only one company showed obvious concern for features appropriate to business data processing. Now, a few companies have already announced machines designed specifically for this market, and many more are very near announcement.

Two separate factors are making these business-oriented mini-

computers attractive to the user.

Price Comes Down

The price has come down considerably from the \$30,000 to \$50,000 prevailing as little as a year ago. And the hardware functions have increased greatly.

Flexible microprogramming makes it possible for the user to have a minicomputer as a dedicated system, but to dedicate it, at different times to more than one function. The system could handle communications, for example, during the day shift.

After the incoming messages were handled, a simple load operation would change the entire nature of the minicomputer to another task, for example, inventory processing.

A user could afford several of these machines as purchase items for the same money spent annually on equipment rental for a system like the 360/30. A typical Model 30 rents for about \$9,500/mo. A user could buy, not rent, 10 minicomputers for the amount spent in one year on the 360/30!

Now that many direct peripherals, such as removable disks and full-size magnetic tapes, have been added to the minicomputer package, users should be able to replace expensive systems with a group of minicomputers, at a far lower investment over a two- or three-year period.

With variable microprogramming, the user could spread the load across several systems, adding more hardware only when the real workload, not the programming and software overhead, forced the addition.

With such a dedicated system, no increase in overhead takes place when more systems are added. This comes as a result of the dedication of the system. Each system runs very efficiently in its temporary specialty, and that specialty can be changed at will!



COMPUTERWORLD

viewpoint

Art Strickland

The Strickland Stratagem

As usual with best sellers, I was the last person to read *The Peter Principle*. The rest of you have known the principle for a long time, which Dr. Peter states succinctly as follows: "In a hierarchy every employee tends to rise to his level of incompetence."

Every man has his level, and, just like water, he will try to find it. (For some it is higher than for others. For instance, it is very high among higher-level language people. In fact, language people often reach their levels of incompetence only in defining languages for computer manufacturers — although few progress beyond that.)

Dr. Peter, as we all know, makes a long and convincing argument that one should avoid at all costs actually reaching his level of incompetence. That last promotion must be escaped! The best known technique for accomplishing this difficult and challenging task is that of *creative incompetence*, whereby the competent individual contrives to manifest some harmless incompetence to give the impression he has already reached his level.

It is a stroke of pure genius, but it is difficult for those who lack creativity. To assist those unfortunates, Dr. Peter offers many suggestions such as: occasionally park your car in your boss's slot; lose an important document now and then; forget to cash your paycheck. The list is long.

Some New Suggestions

Except for forgetting to cash your paycheck, Dr. Peter's sug-

gestions have been milked dry by the uncreative but desperate community. Therefore, I offer the following fresh set, designed specifically for people in the computer business, where, as we all know, our superiors are unusually perceptive and therefore apt to spot all but the most carefully executed phoney incompetence.

1. Forget to cash your paycheck. This one is difficult, not because computer people need their pay, but because it can cost you a bundle in profits from high-flying computer stocks you could have put your paycheck into.

2. If you are in commercial DP, occasionally but consistently remark that APL is the coming thing. If you are a scientific programmer, say Cobol has merit.

3. Miss all your schedules by at least a day or two. It is essential that *all* schedules be missed, since any lower percentage will be considered normal and therefore competent.

4. If you work for IBM, spell disk with a c. If you work for Memorex, spell it with a k.

5. If you are an operator, put a tape label on a disk pack at least once a month.

6. In government agencies, suggest an application now and then which could eliminate personnel.

7. Let it be known at the office party that you agree with Hanlon's stand on Beaver 55.

8. If you earn 10K-a-year, spend more than 130 seconds a week looking for your boss's copy of *Computerworld*.

9. Go to Share and don't join Skids.

10. Programmers, find something productive to do between turnarounds which is not related to your job, like your income tax, your PTA president's duties, or your fingernails. Do not loiter around other cubicles with your coffee cup; you will become known as a very efficient programmer with whom the system just can't keep up.

Now these simple moves, or similar ones of your own design, should protect you from that fatal promotion to department manager, comptroller, or whatever job it is that you're unfit for. They won't take much of your time nor hinder the competent performance of your duties.

However, there are those cases where normal strategy just doesn't seem to work. You're the president's nephew or your miniskirts make your manager feel 10 years younger. For these cases I can only offer the ultimate and extreme technique of *Strickland's Stratagem*. Clip out this column, and send it to your boss's boss with a short but serious note that you think he might find it useful in his own career.

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May 6, 1970

Page 13

C.G.P. Network Plan Aligns I/O Devices Economically

By Don Leavitt
CW Staff Writer

NEW YORK — A service designed to align the I/O device in a user's communications network in the most economic, geographic manner while obtaining maximum line utilization is

being offered by C.G.P. Industries, Inc.

According to C.G.P., the user provides a detailed description of the data network, and from this information the program develops a list of I/O points in the order in which they should be

aligned. C.G.P. said that mileage charges for each line sector and the total cost for each line are also printed.

Specifically, the company expects the user to define the geographic locations of the I/O devices, the traffic generated and

received by each, the type of communications facility to be used, and the percent of line utilization desired.

Corresponding Coordinates

C.G.P. manually translates each geographic location into the corresponding "VH" coordinates, the referencing scheme used by the Bell System. Analyzing these coordinates and the volume and direction of the traffic between them, the program is said to align the points most economically within the limits of traffic capacity for each line. C.G.P. has defined a line's capacity as 80% of possible loading, thus allowing for some unanticipated volume.

A company spokesman said the program is not geared to propos-

ing changes of equipment, such as the addition of concentrators, to alter the basic structure of the network. This type of proposal, he said, would have to be the result of human analysis of the program output and other considerations.

C.G.P. expects the service to be required only periodically by a user. The cost would vary depending upon number of locations to be coded, geography of the network, etc. However, C.G.P. said that normal costs would probably fall in the \$3,000 to \$5,000 range. Available now, turnaround time would also vary according to the amount of analysis required, the firm said.

C.G.P. Industries, Inc., is at 405 Park Avenue.

Medical Specialists Freed From Recording Test Data With Automated Lab System

MAYNARD, Mass. — Medical technicians can gain relief from the recording of test data with Clinical Lab-12, a system for laboratory automation built around the PDP-12, from Digital Equipment Corp.

Clinical Lab-12 is a hardware/software system dedicated to the monitoring and processing of data directly from laboratory instruments which analyze blood, urine, and other body fluids. In addition to entering test results on patients' records, the system is said to produce a variety of reports, including bill-

generates various reports on current patients, the company said, but it finally transfers patient data from active disk files to magnetic tapes for off-line storage.

Acoustical Coupler

The laboratory system consists of a PDP-12 with 8K words of core storage, a built-in CRT display, analog-to-digital converter, a .5 million word disk, a high-speed line printer, four teletype writers, a real-time clock, and an acoustical coupler. Two buffered tape drives are built into the system.

hardware instead of software to tie together the analog and digital portions of the system. The company said that this approach is faster and frees core for more report programming than was possible with Linc-8.

The price of the system, with the computer, is \$109,000.



Clinical Lab-12 Laboratory Computing System

ing summaries by patient, to cut back further on clerical work for the lab staff.

A summary report of all test results on each patient is automatically generated on a line printer. The system not only

Acknowledging that Lab-12 is an outgrowth of the Linc-8 lab system, the developers said that the buffered tapes and the larger CRT are among the chief advantages of the new system.

In addition, the Lab-12 uses

BETHESDA, Md. — Time-sharing programs covering numerical control tape preparation; production, quality and inventory control; industrial engineering; and management are all included in a computer-assisted manufacturing service (CAM) developed by GE's Information Service Department.

CAM features two distinct programming languages. The first, Remapt, is a time-sharing version of Adapt, which creates numerical control tapes for automatically programmed tools. GE said Remapt has the capability of handling 2-1/2 axis contouring and 3 axis point-to-point machine tools. Generalized postprocessors for lathes, milling, drilling, and boring machine tools

are available for use with Remapt.

The Numerical Control Parts Programmer Language (NCPPL), is a user-oriented language with which a parts programmer can write his own vocabulary. The user is also allowed to write his own postprocessor for an existing machine tool, the company said.

The General Job Shop Scheduling program (GJSCH) coordinates such things as number of work centers, routing, operations, processing time, schedules and priorities. GE said that GJSCH can handle an unlimited number of jobs and that factors can be updated at the time a schedule is to be produced.

Inventory — Quality Control

The inventory control programs in CAM are geared for the usual functions: forecasting supply-demand; determining minimum stock levels; and or-

dering economic quantities of materials; and analyzing order amounts when quantity discounts are available.

In the area of quality control, CAM has a program that frames its answers in standard QC terms and includes significant statistical data (tolerances, nominal measures etc.) as well as a histogram. The user thus has a document that describes the accuracy of his operations in both words and diagrams.

GE said that, after an initiation fee, any subscriber to the time-sharing service can use any of the programs, including the CAM package, for a monthly minimum billing of \$100. The company explained that the billing is based on a current rate of \$11/hr for connect-time, 33 cents per computer resource unit and \$1/mo per disk storage unit, which is defined as 1,280 Ascii characters.

System'70 Geared for Office Accounting

SAN FRANCISCO — A package geared to mutual fund back office accounting, called System '70 has been developed by Western Operations, Inc. for use on S360/40 and up under DOS.

An outgrowth of two mutual fund systems begun in 1963, System '70 is the only system that provides complete integration of all areas of shareholder accounting, the company said.

Modular in design, it consists of three basic subsystems: the shareholder accounting; invoice or broker/dealer accounting; and the commission system.

According to a Western Operations spokesman, these building blocks can be used individually or in conjunction with one another.

In addition, the spokesman said, the subsystems can be easily modified so that the user effectively gets a customized system.

Flexible Format

The shareholder system, said the company, uses random access and batch processing techniques to provide all the processing a mutual fund organization presently needs. The records in

this system are flexible in format, in anticipation of expansion to meet future requirements, the developer said.

The invoice subsystem is designed to prepare invoices on a same-day basis for all investments that are unpaid or unsettled. A Western Operations spokesman said that all open items are recorded in detail in this system, and that when paid, they are automatically settled by using the shareholder system.

Automatic reporting to and follow-up with individual brokers and dealers is a by-product of the invoice system, the company said.

Basic to the commission system is the distribution of earnings to a direct sales force but, Western Operations said, this can interface with various commission and payroll systems according to the nature of the particular selling force. In addition to commission statements and checks, the subsystem has been geared to generate comprehensive sales statistics.

Complete System

Summing up System '70, a

Western Operations source said that it is the only system providing complete integration of invoice, shareholder, fund, commission, and sales analysis. The spokesman added that System '70 provides full rights of accumulation and master/sub-accounting. The company also said that there are extensive controls and audits throughout the system.

For 360/40 and Up

Although the bulk of the system is written in Cobol, a segment done in Assembler limits the present version to use on the 360. It is operational on 360/40 and up with 128K memory, three 2311 disk drives, and five tape units.

Cost of the basic System '70 is in the \$100,000 range, but installation charges to adapt the system to the user's needs can add another \$100,000 or more to that base. Western Operations said that the firm is prepared to provide heavy technical support, from feasibility study of hardware through implementation of System '70, or any other software.

Redcor Corp. Introduces Library Of 5 Packages for RC 70, 77, 785

WOODLAND HILLS, Calif. — Software packages for the RC 70 Midi Computer, an operating system for the RC 77 synergetic processor, and a data acquisition executive for the RC 785 data acquisition system are available from Redcor Corp.

The three packages for the RC 70 include a basic "stand alone" group of programs, a magnetic tape operating system, and a disk operating system.

The magnetic tape operating system provides, in addition to the "stand alone" package, the means for storing on tape a user specified operating system, the company said. The disk operating system provides the additional capabilities of a disk, along with the full capabilities of the magnetic tape operating system.

The RC 77 synergetic software system contains a real-time monitor, batch processing monitor, and system generation program. These three subsystems allow

the RC 77 to do simultaneous processing of real time and batch operations, the company said.

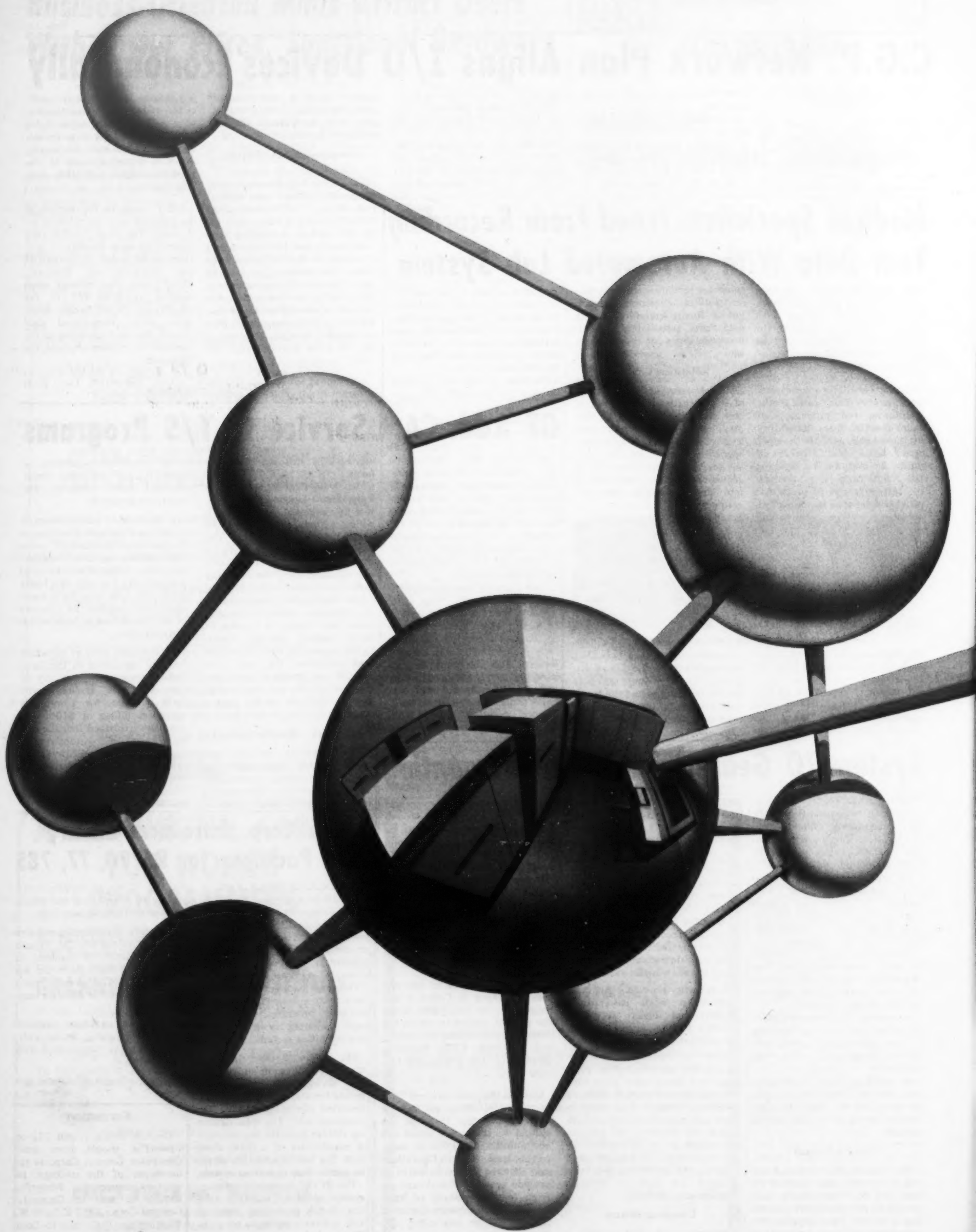
The data acquisition executive is used with the RC 785 to scan input channels in random or sequential order, place the required data in processor memory, and record the data on magnetic tape.

The five packages available now are included, at no extra cost, with the purchase of Redcor hardware.

Redcor's address is P.O. Box 1031.

Correction

The CW article [April 22] on PowerPak should have listed Computer General Corp. as the developer of the package. Inquiries concerning PowerPak should be sent to Computer General Corp., 1812 K St. N.W., Washington, D.C., not to Commercial Associates Inc.



10 questions you should ask about your present operating system ...and about GECOS III

These questions are vital to any user of multiple computer systems . . . anyone struggling to solve the problems of incompatible programs and files . . . any business manager trying to link all his batch, remote access and time-sharing into one common system run from one common data base.

GECOS III* — operating system for General Electric's GE-600 Line of large-scale computers — was first, by years, to meet these problems. And we believe the answers to these ten questions will show you it's still ahead by years.

1. Are you running third generation hardware with a second generation operating system?

"Third generation" means more than just hardware. Operation of a third generation system also demands the capabilities of an operating system like GECOS III — multiprogramming, multiprocessing, three-dimensional concurrent access, and a common data base.

2. Do your \$20,000-a-year computer users waste time carrying work to the computer . . . or waiting for results?

They can write and maintain their programs direct from an input/output terminal with GECOS III. One operating system gives them a reactive interface to all software in your system. That's one reason why others are trying to copy GECOS III.

3. Are you adapting your business to your computer? Or your computer to your business?

GECOS III evolved to meet user needs. First, it keeps tabs on what your workload is through video system monitoring (VISTA), hard copy monitoring (System Resource Monitor), detailed accounting reports and system simulation. Then, it multiprograms your batch, remote access and time-sharing jobs simultaneously . . . and provides service on demand when you need it.

4. How long does it take to reconfigure your system? All day? Hours? Minutes?

GECOS III adapts itself to any standard configuration. It's truly automatic — the one operating system that matches third-generation software with third-generation hardware.

5. When one module fails, does your system go down?

Not a United System with GECOS III. An on-line test and diagnostic system monitors the central computer's peripherals

and communications processors while the system keeps running. Troublesome system modules can be isolated before failure occurs. GE field engineers can then make repairs while the rest of the system runs normally.

6. How many separate file systems do you need to support your business?

Only one central integrated file system with GECOS III. The data base is conveniently accessed by batch, remote batch, or time-sharing programs. You get the flexibility you need to build your own management information system.

7. Can your FORTRAN and COBOL programs talk directly to any remote terminal on the system?

They can with GECOS III's unique remote access capability. Messages are never delayed in centralized message queues. Each message is placed under the complete control of the application system designed to service it.

8. How much does your business pay for time-sharing over and above your normal computer expenses?

GECOS III lets you assign whatever resources you need to support a variable time-sharing load, and to alter those resources dynamically throughout the day. Your users get access to a wide range of time-sharing capabilities . . . plus terminal access to all batch software.

9. Is your system's performance limited by your operators' abilities? Or is the system self-optimizing?

A United System with GECOS III optimizes its own operation by managing system resources and automatically scheduling your work. Your operators get their direction from the system, thus they can help make your operation truly productive.

10. Do you use multiple systems to serve multiple applications?

As a typical example, GECOS III can do all five below simultaneously:

- remote inquiry
- on-line data processing
- batch data processing
- engineering analysis
- text editing

GECOS III is just one of many reasons why a GE United System can help you unite your computers, your people, and your business now. For more information, call your nearest General Electric Information Systems Sales Representative. Or write to General Electric Company, 1 River Road, Schenectady, New York 12305. 290-74

*GECOS: Trademark of General Electric Co.

GENERAL  ELECTRIC

General Electric Computers: The United Systems of the 70's

Service Schedules Workloads for Multiprogramming

CHERRY HILL, N.J. — A time-sharing service has been developed by Value Computing Inc. which schedules the workload in a user's data processing installation to maximize the multiprogramming capabilities of his third generation CPUs.

Called the On-line Performance Scheduler (OPS), the service requires none of the user's own memory storage or computer time.

Value Computing Inc. said that OPS requires installation of a teletypewriter in the user's location, and development of a control file containing profiles of all user programs, a model of his computer system, its configuration, and other relevant informa-

tion.

Using this data base, developed by Value's technicians, OPS generates the 'one-best' schedule to maximize the CPU's multiprogramming capabilities while remaining within the user's time constraints and input availability.

Normally the user's supervisor calls for OPS at the beginning of each shift, and gets back a minute-by-minute schedule that also spells out multiprogramming partition or level, and task or job stream identification for each job to be run that shift.

If priorities change suddenly, jobs are added or deleted, or if a peripheral malfunctions, the supervisor goes back to OPS and

a revised schedule is generated.

Value said that, in addition to the scheduling function, OPS also accumulates data for management reports, showing schedule deviations, hardware performance and system analysis.

OPS is presently capable of scheduling IBM 360, RCA Spectra 70, and the GE 400

series. Modifications to the machine-definition portion of OPS will allow it also to schedule third generation Univac and Honeywell equipment, according to the firm.

Now operational on Univac 1108 and IBM 360/67, OPS will be implemented on various time-sharing services, to make it

more readily available to users, Value said. Because they cannot set prices for the time-sharing services, Value spokesmen are only willing to estimate that OPS, after preparation of the control file by Value, will cost users about \$1000/mo.

Value Computing Inc. is at 383 Kings Highway.

Applicon's 'Match' Aids Circuit Design

BURLINGTON, Mass. — Applicon Inc. has available a proprietary service, called Match, which provides for optimization of circuit parameters to improve circuit design.

The user can specify a desired frequency response, giving either the magnitude or phase. Match then takes the design and varies its element values to fit the response to the desired para-

eters.

Match, an interactive program, is applicable to any practical cascade circuit, including a wide variety of active filters, and it also provides an 'unusually' comprehensive analysis capability, the company said. A large variety of exact sensitivities and partial derivatives can also be computed.

The results of Match's output can be plotted against linear or logarithmic frequencies, as well as normal or expanded Smith charts. Special parameters permit the simulation of correlated component variations such as those that accompany temperature changes or aging.

The service is designed for remote access from a Teletype or similar terminal. Charges for Match are a function of how the program is used, the typical hourly charges run in the \$40 range. Complete user documentation is included.

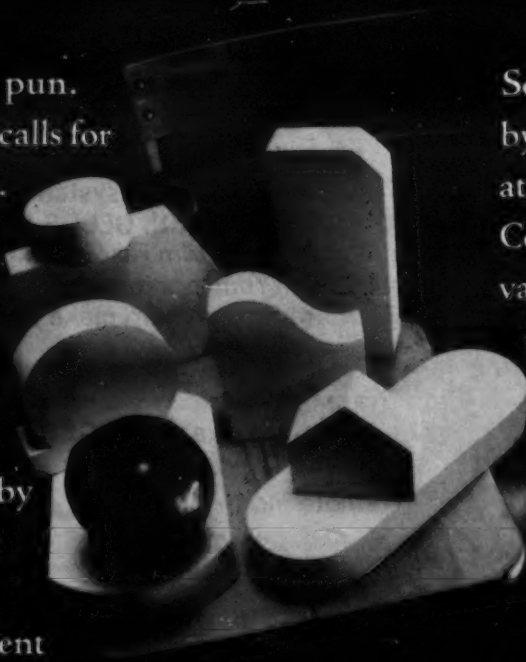
Applicon Inc. is at 83 Second Ave.

Magna cum puter.

Sorry about the pun.
But unusual news calls for unusual headlines.
The news: A new, comprehensive program of computer science education conducted jointly by Boothe Resources International and System Development Corporation, one of the pioneers in the field.

It's different and rather more practical than the training that manufacturers provide.

The curriculum includes basic and advanced courses for data processing specialists, and courses for generalists who want a realistic, management's-eye view of data processing.



Scheduled classes are taught by SDC and BRI instructors at the BRI Computer Resource Center, 3550 Wilshire Boulevard. Teaching resources include the CRC's data processing facilities, technical library and working professional staff. Standard courses or custom training programs, tailored to your company's specific needs,

can be taught on your company's premises. If you're interested in computer science education for yourself or for your company, call BRI at (213) 380-5700 ext. 202 or SDC at (213) 393-9411 ext. 355. "Magna cum puter" is more than a pun. Write to us at the BRI Computer Resource Center for a complete catalog. You'll see what we mean.

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7. Off-line vs on-line

If you're considering the potential of an on-line computer output microfilm, you may want to explore the art with an off-line unit first. Assign it sample evaluation tasks without tying up your entire computer operation. Put it alongside your impact printer for cost analysis.

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Package Suited for On-Line Managerial Inquiries

ENGLEWOOD, Calif. — On-line management information and accounting in a conversational (through Teletype or CRT terminal) manner is possible with a software package developed by Computing Corporation International (CCI).

According to the company, the system can be used to enter and retrieve specific data and to generate a variety of reports. Management areas covered include order entry, inventory, accounts payable and receivable, payroll status, profit and loss, and current balance sheet. Simulations and financial projections may also be performed, CCI said.

Prepares Invoices

Invoices, statements, purchase orders, payroll, and payable checks can all be prepared by

the system, which also performs all the accounting associated

Software/ Services

with these activities.

Written in Fortran IV, the system has been designed for a variety of time-sharing computers, including S/360-50, the DEC PDP-10 and the GE 400 and 600 series, utilizing the standard time-sharing support provided by the manufacturers. CCI said that the versions for the PDP-10 and the GE 420 are available "on the shelf."

CCI expects that most installations of the package will include

turn-key situations, in which CCI technicians will spend three to six months at the users' sites, tailoring data bases and redesigning systems to maximize the effectiveness of the CCI package. For that type of installation,

CCI has set a price of approximately \$60,000.

Purchase price of the package by itself, with self-implementation by the user, would fall in the \$20,000 to \$30,000 range, a CCI spokesman said. Customized

versions, systems studies and computer systems evaluations are quoted on an individual basis.

Computing Corporation International is at 3375 South Bannock.

'Autotab' Produces T/S Tabular Reports

PHOENIX, Ariz. — Autotab, a time-sharing service to produce tabular reports, has been developed by Capex Corp. Compared to manual methods, Autotab can reduce the time and effort of producing reports by 50% to 75%, according to the company.

The Autotab user outlines the format and calculations to be performed on the data, which is entered through a teletypewriter

or IBM Selectric terminal. Calculations can include manipulation of fields shown previously on the report, in addition to subtotals and grand totals.

Making Revisions

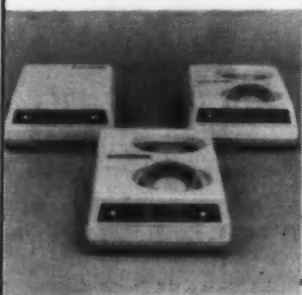
Once the report has been printed, individual items can be updated or corrected and a revised report automatically generated. Capex said that portions of pre-

vious reports can be included in new or consolidated reports, through a COPY command.

The Autotab service is available through Capex on the GE time-sharing network, for an initial fee of \$100. After that, Autotab users will be billed by GE for their monthly usage and by Capex for the royalty fee based on the usage.

Capex Corp. is at 5055 North 12th St.

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Boy, do I have problems!
Some instructions have to execute in 1.2 microseconds
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and some I want to store in read-only memory.
Do I need three separate computers?
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Everyone pays more attention to mail in a conventional envelope with the address typed on the envelope itself. Did you know you can give your computer mailings this warmly personal look with our Chain-O-Matic continuous envelopes? They look like conventional envelopes rather than some kind of folded form. They're securely attached to the carrier sheet along both short sides, so they run smoothly through your printer for "typed" addressing directly on the envelopes. Then, stripped from

the carrier sheet, they run smoothly through your inserting and postage metering equipment because of their conventional construction. Available in large and small envelope sizes, is our Chain-O-Matic system a better way to handle your addressing and mailing in volume? It is. And that's the way it is with all our products, because we continually look for ways to make each of our envelopes and forms more useful to you. For samples, write: C-O-M Envelopes, Curtis 1000 Inc., 1000 Curtis Drive SE, Smyrna, Ga. 30380.



CURTIS 1000

making envelopes and forms more useful to you

Documatic Available on Free Trial

BOSTON — Boston Computer Software Corp. is offering a free 10-day trial of Documatic, the automatic 360 RPG documentation system, to qualified IBM RPG users, who submit a request on company letterheads.

Documatic produces English language translation of 360 RPG programs as well as producing a system's flow chart, and input and output record layouts. Customers can use Documatic for debugging, conversion, programmer training, auditing, and standardized documentation, the company said.

Documatic, created by Data Usage Corp., is available from the Boston Computer Software Corp., and fits any 360/20 system or 360 running under DOS.

The Documatic price starts at \$80/mo rental or \$1600 purchase. The company is at 15 School St.

Software Records Written To Meet IRS Regulations

CHICAGO — The detailed written records required for programming costs to be treated as capital expenditures under new IRS regulations are available from Software Documentation Corp. (SDC).

According to SDC, the automated part of the documentation service utilizes the Quickdraw and RPG AID systems, and can be used for programs written in Cobol, PL/I, Fortran, BAL, Autocoder, SPS, or RPG.

The documentation produced includes source listing; data-name, tag-name, and paragraph-name cross-references; functional equate tables, along with tables of modified instructions; and format and coding logic diagnostics. All these, the company said, are cross-referenced to a detailed flowchart of program logic.

An SDC spokesman said that the company was also willing to go beyond the automated documentation by providing systems flowcharts, record layouts, and operator instructions designed for user needs.

The company said that input for the documentation services can be individual source card decks, card images on tape, and some master program library tape files.

Cost of the automated service for separate programs is based on a charge of 3 cent/card, for the first thousand cards, and two cent/card thereafter, subject to a minimum of \$10/program. SDC said that the company would provide a blanket quotation if a user wanted to have an entire installation documented.

Software Documentation Corp. is at 3550 West Peterson Ave.

Electrical Engineering Package Performs Standard Job Functions

ANN ARBOR, Mich. — An electrical engineering package designed to allow the electrical engineer total capability to perform various job functions is available from Shared Applications Inc.

The package includes a microwave circuit analysis program, a nonlinear circuit analysis program, an electronic circuit analysis program, a programmable automatic network testing system, and a continuous system simulator.

Each program in the series covers a different area in the electronic field. The series has the same operating characters making it easy to go from one program to another, the company said.

The programs are available on a royalty fee plus license basis at a price of about \$60,000. The price includes technical and marketing support, the firm said.

Shared Applications is at 209 E. Washington Ave.

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In data processing, MVT means Multi-programming with a Variable number of Tasks . . .

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For more information call Bill Adams at: (212) 757-5500.



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SUBSIDIARY OF SICOBY CORPORATION

MEMO TO: Computer System Users
FROM: George McAlister, Jr., President
SUBJECT: Price Tags

If you're in the market for a small or medium scale computing system with a small price tag, the Datamate 16 may put an end to your shopping. It's a shopper stopper when it comes to computing power per dollar. And since price tags weigh heavily in the buying decision, let's start with the price before we explore the system description and specifications on the Datamate 16.

The System costs less than \$24,000*, and here's what it includes:

- Datamate 16 with 8K memory
- ASR 33
- Controller for 4 IBM compatible 9 track mag tape units
- Disc controller

Now let's examine the processor. The Datamate 16 is a powerful 16 bit computer with speeds and I/O capabilities that take it out of the mini-computer class. Here are just a few of the specs by which you can measure its performance:


- One microsecond cycle time
- DMA rate of 1 million 16-bit words per second
- Hardware multiply and divide times of 7 & 9 microseconds respectively
- Full 16-bit arithmetic, add and subtract times of 2 microseconds
- The easiest computer on today's market to interface with peripherals.

Naturally the detailing of a total systems approach with price tag is too much for one memo. It does, however, give you an idea of what a system would cost matching your own particular requirements. We'd be happy to give you an exact price tag when you write or call me or my marketing director, John Atchley.

Datamate Computer Systems, Inc. P. O. Box 310 Big Spring, Texas 79720

*An installation for the Federal Government was a little more sophisticated, and included two DMA channels, power fail-safe and restart, two high performance magnetic tape units with controllers, both operating off the DMA channels, plus an ASR-35 teletype. It's performing beautifully at an installed cost of less than \$30,000.

\$24,000



For
Those
Who
Think
Small

Here's the disc storage system for mini computers—Peripherals General Model 816/716. It interfaces directly to sixteen bit computing systems, and no other hardware is needed. The drives use 1316 disc packs and are plug-to-plug compatible with the IBM 2311. The sixteen bit controller can

handle two drives and is tailored to the individual interface. Capacity is 116 million bits. About price, you can think particularly small. The basic system is in the \$20,000 range. In OEM quantities it is considerably less. Delivery has also been miniaturized. It begins in July.



Peripherals General Inc.

Cherry Hill Industrial Park, Cherry Hill, NJ 08034 (609) 424-2010

(SJCC Booths: 10012-10013)



DPF Model 2427

Telex, DPF Offer Compatible Replacements for IBM 2420-7

By Frank Piasta
CW Staff Writer

Plug-to-plug replacements for the IBM 2420 Model 7 magnetic tape drive, the highest performance IBM drive currently available, have given users an alternate choice in selecting high-speed drives.

Two units, one by Telex Computer Products, the other by Data Processing Financial and General (DPF), offer the user the performance and ease of operations of the IBM drive, at significantly lower cost.

Telex 5420/7

The Telex 5420 Model 7 is said by Telex to save money for the IBM user, and also offer him engineering features not available elsewhere.

One of these features, called Pneu-Latch, is a method of mounting the tape reel to the drive. A vacuum is used to pull the reel onto the hub. The reel is

then automatically locked in place, mechanically. This, according to Telex, insures proper reel seating and a perfect tape path.

Another feature of the 5420 Model 7 is an automatic threading mechanism that allows conventional reels of magnetic tape, as well as tape cartridges, to be loaded automatically.

The Telex device has a capability of 1,600 bit/in. 9-track, with a data rate of 320K byte/sec, maximum.

The Telex 5420 Model 7 will lease for \$895/mo including maintenance, which is a 12% reduction from the IBM price for the 2420 Model 7, of \$1,020/mo.

First customer delivery is scheduled for the fourth quarter of 1970.

Telex Computer Products is at 6422 E. 41st St., Tulsa, Okla.

DPF 2427

The DPF Model 2427 is also a 9-track drive, capable of recording data at 1,600 bit/in. It can handle tape at 200 in./sec, or 320K.

The 2427 uses a single capstan and vacuum transport mechanism. This, according to DPF, results in less wear and tear on the magnetic tape itself. A self-loading feature of the drive is

also said to result in longer lasting tapes due to less handling by the operator of the device.

In addition to standard 1/2-in. magnetic tape reels, the drive can make use of IBM magnetic tape cartridges.

The DPF drive is currently undergoing field testing at a DPF site. The data processing manager of this installation told CW that the ease of operation of the new device has caused a minor problem for him. His operators are ignoring other drives on the system and are trying to use the DPF drives as much as possible.

DPF claimed that the 2427 was completely compatible with the IBM 2420, Model 7, and that it could be plugged into the controller for the IBM device with the same cabling used by the 2420.

DPF said the 2427 is one of the few magnetic tape drives available that carry the Underwriters' Laboratory label.

Customer shipments of the 2427 are scheduled for July 1, 1970, on a 90-day delivery schedule.

Rental price on a one-year lease is \$867/mo; on a five-year lease, \$663/mo. The drive may be purchased for \$39,720.

Data Processing Financial and General is at 141 S. Central Ave., Hartsdale, N.Y.

Varian Has 620/i Accessory I/O Module

PALO ALTO, Calif. — A digital I/O module from Varian provides 620/i users with a method of connecting instrumentation and equipment with digital I/O provisions to their computers.

The module is said to be useful in setting up experiments, breadboarding prototype systems, and developing specialized interfaces.

Features include buffered I/O registers, flag and reset control lines, lamp display of 16-bit data word, 16 toggle switches for manual data entry, sense switches, sense line inputs, and optional interrupt capability.

In use as a data bus monitor, the unit can display on the 16 lamps all data transferred in or

out of the 620/i computer and/or all I/O commands emitted by the 620/i, Varian claimed.

As an experimenter's interface, the unit will interface to digital voltmeters, strip printers, and incremental tape transports.

The unit contains parallel register-buffered-input and register-buffered-output channels. I/O channel access is either through front-panel mounted connectors, switches or jacks. Rear panel controls can be set to allow the unit to display all 620/i function commands or transferred data.

Normal operation is under program control using the standard 620/i instruction set for data transfer via the unit, the company stated.

The digital I/O module is priced at \$3,275, and is available now on 30- to 60-day delivery. Varian is at 611 Hansen Way.

New Syner-Data Terminal Has Multiple Band Rates

BEVERLY, Mass. — A keyboard printer terminal with switch-selectable baud rate may be used as a teleprinter terminal and as a business form line printer, according to the developer, Syner-Data.

The Beta terminal, used as a teleprinter terminal, operates at 10, 15, and 30 char/sec. As a business form printer terminal in applications not demanding high line printer speeds, the device has an adjustable column width from 26 to 132 columns, permitting use with standard preprinted business forms for 3- 5/8 inch mailing labels to 14- 7/8-inch inventory and payroll sheets, the company said.

Impact printing in the terminal provides up to six clear copies with carbon interleaved forms. Automatic perforation skip through top of form control is standard.

Beta utilizes the standard Teletype ASR-33 keyboard layout and provides all 32 Ascii control codes. Standard interfaces for Beta include EIA RS-232C, computer TTY channel serial, and computer bit-parallel broadside types.

Options available include a 30 char/sec reader/punch (Syner-Data Model 30), and a 300 char/sec reader/punch (Syner-

Data Model 300).

Delivery is from stock to 30 days. The Beta terminal costs \$3,700 for receive only; \$4,260 for keyboard send/receive; and \$5,990 for automatic send/receive.

Syner-Data is on Route 128 at 133 Brimbal Ave.

Odec Line Printers Connectable To Most Mini Punch Interfaces

E. PROVIDENCE, R.I. — Two impact line printers from Odec Computer Systems, Inc. are designed to be connected to the paper-tape punch interface on most minicomputers.

The desk-top Models 200 and 400 print 80 columns at 205 line/min and 132 columns at 410 line/min, respectively. Both models utilize 64-character Ascii

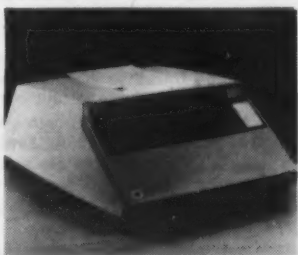
sets with up to 128 characters optional on the Model 200, and 48 or 96 characters on the Model 400.

The Model 200 accommodates paper up to 11-3/4 in. wide, while the Model 400 can take paper up to 16 in. wide. The standard interface uses a parallel input, but a serial-to-parallel converter is available as an option.

Other options include multi-channel form control, and parity checking which prints a special character in place of the character in question, in case of a parity error.

The Model 200 is scheduled for June delivery, and is priced at \$6,900. The Model 400, scheduled for September availability, is priced at \$8,900.

Odec Computer Systems, Inc. is at 871 Waterman Ave.



Model 200 Line Printer

1.2 Idiiom Can Display 2 Images Simultaneously

MOUNT KISCO, N.Y. — A dual 21-in. CRT version of the Idiiom display system is said by the manufacturer, Information Displays, Inc., to be suitable for management information centers and data retrieval.

cludes a graph drawing program, a Fortran IV debugging package, a program of grid subroutines, and text editing subroutines (TED).

Although the 1.2 Idiiom system can operate as a freestand-



Model 1.2 Idiiom Interactive Graphic Display

Called the Model 1.2 Idiiom interactive graphic display, the equipment enables the operator to monitor a large system on one screen while working interactively with a detailed portion of the system on the second screen.

The Model 1.2 Idiiom incorporates a light pen, Teletype ASR 33, and a 32-key function keyboard for instructing the display, inserting or editing data. Hardware generators produce vectors, alphanumerics and circles.

The display has an 8K by 16-bit programmable memory unit, expandable to 32K with additional I/O devices and memory units. Software supplied in-

ing unit, the displays may be interfaced with all current large computers, the company stated.

Price of the 1.2 Idiiom without computer interface is under \$100,000. A four-year lease is under \$3,000/mo. Other lease plans are available. The price includes a one-year guarantee and four preventive maintenance visits during the first year.

The display is available on 60-day delivery.

The company offers courses in maintenance and programming at \$200/week for each person. On-site teaching arrangements can be negotiated, said a spokesman.

Information Displays, Inc. is at 333 N. Bedford Road.

'Dynabit' Uses Magnetic Wiring as Storage Medium

FULLERTON, Calif. — A bulk memory device that uses magnetic wire as a storage medium is expected to be competitive with drums, disks, and magnetic tapes, said the developer, Hughes Aircraft Co.

The device, called Dynabit, is said to reduce by 70% the size and complexity of bulk-memory controllers.

Based on a process patented by Hughes, Dynabit uses magnetized regions (domains) on a wire to store bits of data — one bit per domain. Data can be stored indefinitely, or electronically moved at speeds up to 200K bit/sec.

Stick Storage

The magnetic wire is wound around a tube-like structure called a "stick." Storage capacity of the stick depends on how many turns of the wire are used, but 25 bits can be stored per turn.

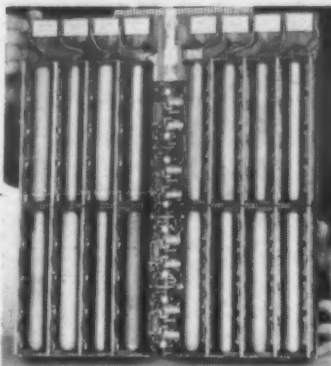
One element, about 8 in. long

and .8-in. in diameter, can store more than 6,000 bits, Hughes said. An almost infinite number of elements can be used to achieve almost any size memory required.

Advantages of the device cited by Hughes include: high reliability due to a non-volatile, non-rotating design; increased throughput due to reduced latency time; reduced buffer requirements in main memory due to asynchronous, on command operation; resistance to shock, vibration, and temperature changes; and simplicity of construction due to the lack of moving parts.

Dr. Norman H. Enenstein, manager of the company's data processing products division, said the Dynabit memory element is formed by positioning the magnetic wire on a cylindrical substrate forming a helix.

Information is entered into the memory element by a stationary write head that controls the



Dynabit Bulk Memory System

state of the magnetic domain at the input end of the wire. Information is strobed statically and is shifted only upon command, Enenstein pointed out. If not shifted, the information will remain in its original location.

Shifting of information toward the output end of the wire is accomplished by logically controlled, two-phase currents in a

pair of adjacent propagation windings that result in magnetic-domain wall motion.

A "read" head, located along the wire from the "write" head, senses the state of the magnetic domains as they pass beneath it. Information is restored in the element in its proper sequence by connecting the sense amplifier at the read head to the write amplifier at the write head.

Propagation Time

The latency of the information is determined by the spacing between the write head and the read head, and by the propagation time. Unlike a drum or disk, the latency in the Dynabit memory technique can be minimized by careful organization, since the information does not move unless directed to do so, Enenstein said.

Dynabit memory elements generally are arranged in an array,

providing random access to a block of data and serial, asynchronous access within the block.

Primary applications are both large and small secondary memories, competitive with disk, drums and special tape techniques; buffer memories, competitive with core-memory techniques in communications systems; applications where information streams must be transformed in time and space domains; and in pipeline computers, where sequential access is desired.

Hughes Aircraft has not set firm prices on the unit, but a spokesman for the company estimated that the cost would range from 1/10 cent to 1 cent per bit of storage, depending on configuration.

Customer deliveries are scheduled to begin in the fourth quarter of 1970.

Large 360's have a friend in the ASTRODATA ELECTRONIC DATA SORTER

Would you like to help build the success of the major peripheral breakthrough in this decade? The Sorter is compatible with 3500 System 360's using OS. The Data Devices Division was formed 18 months ago to develop this unique peripheral.

Astrodata has it. System 360 needs it. And we are staffing to meet this need by adding:

SALES MANAGERS who know the EDP market place and want to be part of building a complete organization to sell the Sorter.

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FIELD CUSTOMER ENGINEERS who want to use their System 360 experience in a complete service organization and know how important the service function is to the continued success of their company's product.

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Industrial Disk Memory Designed for Mini Use

DETROIT, Mich. — A disk memory system, specifically designed for use with minicomputers in industrial environments, has been developed by Information Data Systems.

The 5000 series Disc Memory System is able to withstand, reliably, a wide range of temperature and vibration conditions, the company said. It can be used in atmospheres corrosive to normal disk units by employing an inert gas option, which pressurizes the disk unit with nitrogen gas, keeping the corrosive atmosphere away from sensitive internal mechanisms.

The 5000 Series consists of a disk memory unit and controller, which are designed to interface with the Interdata Model 3 and the Data General Nova minicomputers. Models for the PDP-8 and Lockheed Mac-16 are scheduled to be released shortly.

The disk memory system is available in models from 8 to 64 tracks with a track storage capacity of 2,048, 16-bit words, or 4,096, 8-bit words, giving a capacity per drive of 131K or 262K words, respectively. Average access time is 16.5 msec.

Up to eight disk drives can be attached to a controller. This makes the total system capacity for the Interdata machine equal to two-million, 8-bit words, and the transfer rate 150K word/sec. A Nova system can have a capacity of one-million bytes and a transfer rate of 75K/sec.

The controller is priced at \$4,000. The disk memory systems range from \$2,950 for the 16K, 16-bit or 32K, 8-bit drives to \$6,600 for the 128K, 16-bit or 256K 8-bit units.

Information Data is at 8260 E. Eight Mile Rd.



you are managing a DP operation — or are putting together a management information system . . .

your budget is limited, your staff small, and your computer not a giant . . .

your management needs reports that are based on file information . . .

then — you have problems of creating, maintaining, and retrieving information from files.

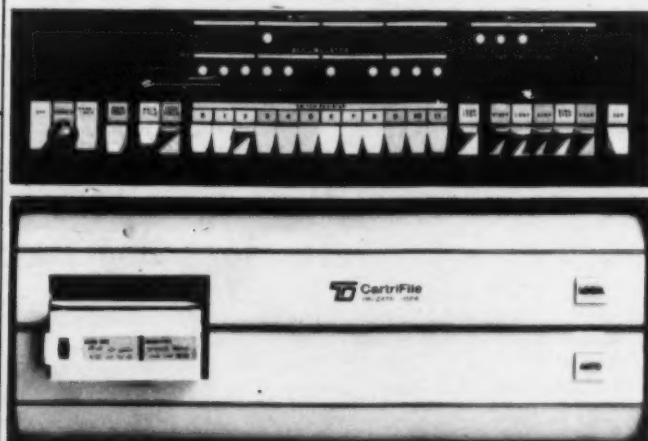
These are severe problems when your management needs customized reports quickly but there is no easy way for them to generate their own. You, or your staff, must do this for them. Results? Fair to good, but never 100% satisfying.

Until now there has been no easy answer. FILE EXEC 70 is a system that your managers can learn to use in two days. It is not necessary for them to write programs, but only specify parameters. Users only need to know the external characteristics. As DP manager, you may wish detailed information on internal characteristics of FILE EXEC 70 to evaluate it.

First there is the *System Description* covering characteristics of language types and forms, modes of use, file media, documentation, etc. *Data Structure* includes types of groups, entries, files; and their identifications. *Functions* precisely defines the preceding items and also covers interrogation, selection criteria, file creation, etc. *Storage Structure* specifies storage representation for item levels, entry and group levels, file levels, and multiple files. *Operational Environment* gives details of basic and expanded hardware, software, and systems requirements. Prices are also provided.



Pioneer Data Systems
Suite 308, Merle Hay Tower
Des Moines, Iowa 50310 (515) 276-6746



NEW FROM TRI-DATA

the CartriFile 1024

The new CartriFile 1024 gives you a low-cost cartridge-loaded magnetic tape unit for use with mini computers, data terminals, test equipment, process control systems.

It reads and writes data on the same two-tape cartridge used in the companion CartriFile 4096 four-transport tape system. Data written by the 1024 may be read on the 4096 and vice versa.

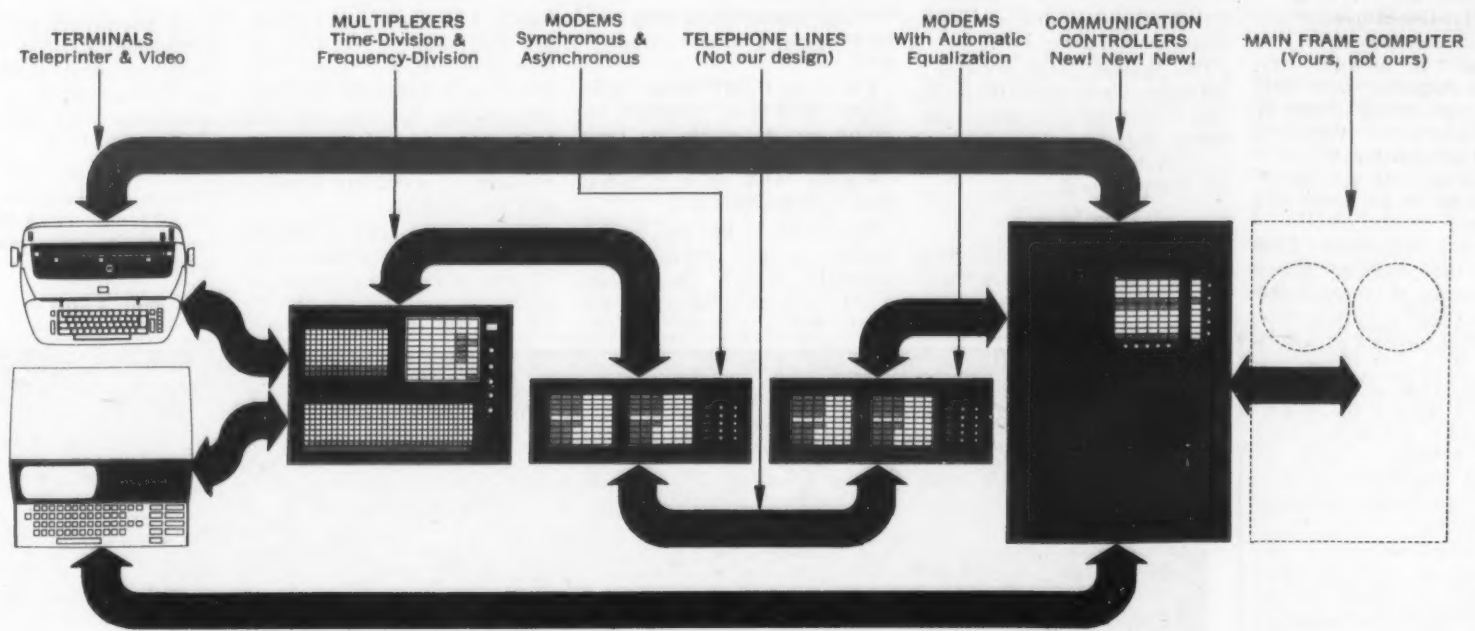
The 1024 CartriFile incorporates tape transport and controller, read and write electronics, and power supply. Prices start at \$2,550.

Interfaces are available for 24 mini computers.

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ONLY ADS can offer you the system study, software, hardware and field maintenance to move data from fingertips to readout — hard copy or video.

ADS HARDWARE includes terminals, multiplexers, modems and communication controllers:

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MULTIPLEXERS & MODEMS by ADS save telephone line costs, simplify system design, and feature complete front panel diagnostic display — an ADS exclusive. Various channel capacities, intermixed baud rates, byte-interleaved, bit-interleaved, with full contention, automatic baud rate detection, and automatic modem equalization.

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Data/Tape 2100 System Has 24K Character Storage

By Christine Magnuson
CW Staff Writer

DALLAS — A multiple keyboard-to-magnetic tape data input system is being offered by General Computer Systems, Inc. The data preparation system is claimed to give the user significant savings in personnel and equipment.

Called the Data/Tape 2100 System, the modular system utilizes a series of terminals connected to a general-purpose computer (called the data accumulator).

The Data/Tape 2100 system consists of from 8 to 31 keyboard/printer terminals, comparative verifiers, a data accumulator, disk memory system, magnetic tape drives, and supervisor's stations.

Each keyboard/printer terminal may be used for data entry, key verification, or updating. A terminal consists of a keyboard which permits three modes of operation: as a regular typewriter; as a standard 029 keypunch configuration; and as an auxiliary keyboard arranged with key positions of a 10-key adding machine.

The strip printer produces characters on a 1/2-in. wide paper tape spaced at 10 char/in.

The keyboard/printer terminals within the system can operate independently of all others, and the terminals are interchangeable.

The data accumulator, the central control element and working memory of the system, has 12,000 16-bit words, or the equivalent of 24K characters of high-speed random access storage. This storage is used for the system software, the job control programs, and the buffer storage of data from the input stations. The software includes standard format edits.

Optionally, the data accumulator memory can be expanded in 8K character increments to a maximum of 64K characters.

8 μ sec Cycle Time

The data accumulator, with 8 μ sec cycle time, has a maximum data rate of block I/O 250,000 byte/sec. The controller contains 122 basic instructions including multiply and divide; direct, indirect, indexed and relative addressing modes; three interrupt levels (standard); and DTL and TTL five-volt integrated circuits.

The disk memory system provides for interim storage of data records as information is input to the system and has a basic capacity of 850K characters of storage. The basic System 2100 utilizes a data storage unit expandable up to 3,400,000 characters of storage, in relation to the number of operators associated with the system.

Rotating magnetic disk memories with fixed read heads comprise the data storage.

The supervisor's station serves as the control center of the system, performing as a normal input station, as well as carrying out system management and reporting functions.

The station includes a keyboard/printer, disk status reports, batch status reports, page teleprinter, job specification setup, up to 256 jobs (each job with up to 50 formats of up to

50 fields), operator statistics, and chair and desk.

The System 2100 includes a software system with DP editing and control features. Special customer requirements can be incorporated into the software, the company said.

Three Methods

Three methods for verification of the data entered are available to the user. The first is a matter of one operator rekeying at any

terminal the work originally keyed by himself or another operator.

The second verification technique utilizes a variation on proof reading which has been proven and demonstrated in association with OCR (Optical Character Recognition).

The third technique, on-line editing, is used whenever the computer within the System 2100 can check the operator's work. The system does this in-

stantly and allows the operator to correct his mistakes immediately, the company stated. This technique can eliminate the need for a second operator, the company said.

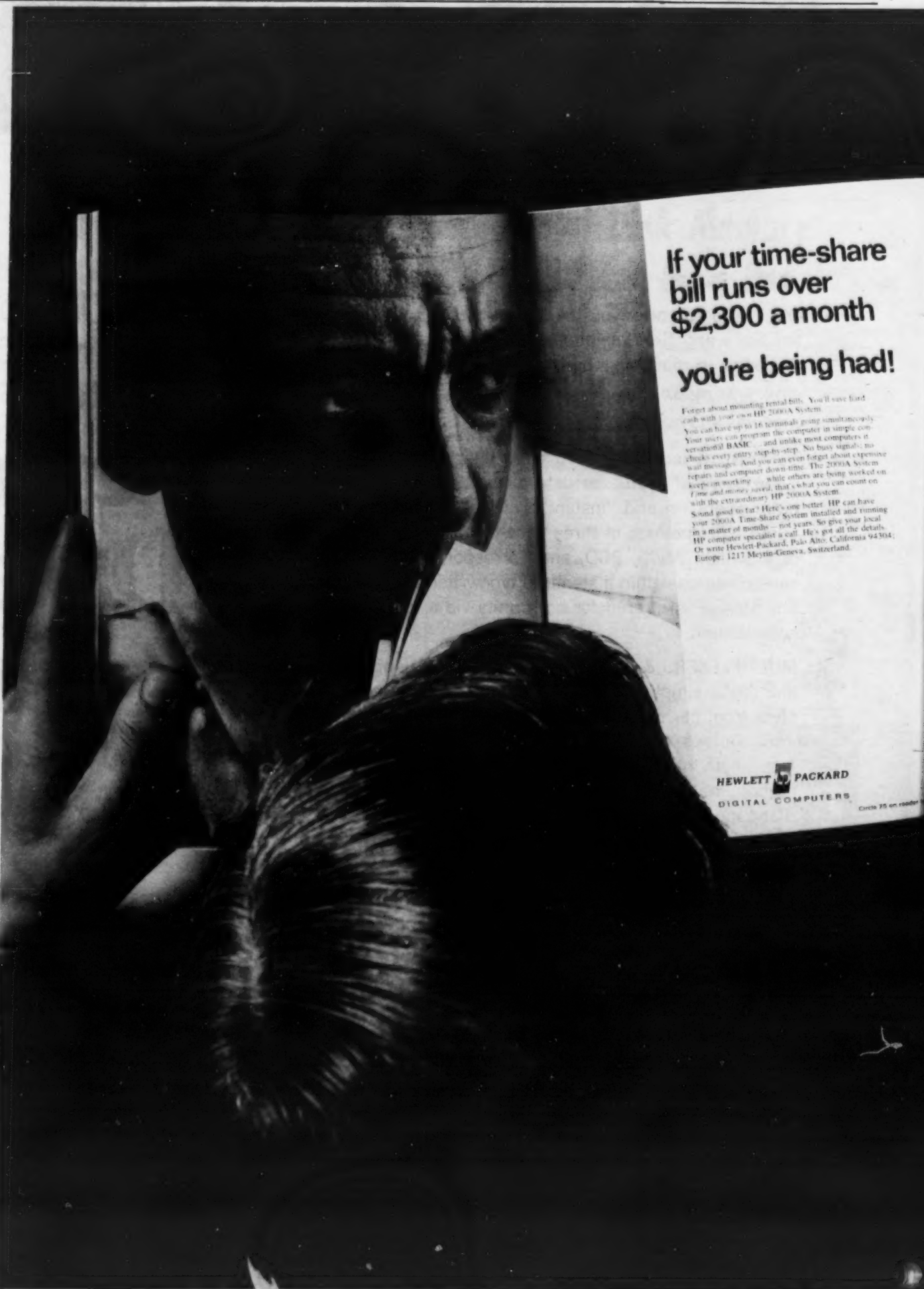
The Data Tape 2100 System is available on a delivery schedule of about 90 days.

The purchase price is \$88,600 for a System 2100 configuration of one tape drive, storage of 850K characters on one disk (or 12 girl-days storage, with only

the keystroke stored), seven terminal input stations, one supervisory terminal station which can be used for work, and data accumulator. Maintenance is an additional \$295/mo.

A three-year lease for the above configuration is \$2,405/mo, including maintenance. Five-year leases are also available.

General Computer Systems, Inc. is at 12011 Coit Road.



If your time-share bill runs over \$2,300 a month you're being had!

Forget about mounting rental bills. You'll save hard cash with your own HP 2000A System. You can have up to 16 terminals going simultaneously. Your users can program the computer in simple conversational BASIC — and unlike most computers it checks every entry step-by-step. No busy signals; no wait messages. And you can even forget about expensive repairs and computer down time. The 2000A System keeps on working — while others are being worked on. Time and money saved, that's what you can count on with the extraordinary HP 2000A System.

Sound good to you? Here's one better. HP can have your 2000A Time-Share System installed and running in a matter of months — not years. So give your local HP computer specialist a call. He's got all the details. Or write Hewlett-Packard, Palo Alto, California 94304. Europe: 1217 Meyrin-Geneva, Switzerland.

HEWLETT-PACKARD
DIGITAL COMPUTERS

Circle 75 on reader

Photomation Can Digitize Pictorial Images in 70 Sec

MINNEAPOLIS, Minn. — A system for digitizing and re-converting high-resolution pictorial images has been developed by the Dicomed Corp.

Called Photomation, the system is said to make practical the use of a computer to analyze and/or enhance pictures and X-ray negatives.

Consisting of a digitizer for input; and the Dicomed 30 8-in. CRT image display, the system is said to be able to digitize a

35mm or 70mm transparency in 70 seconds, and to convert the digital information to a CRT image in approximately 100 seconds.

Previous methods of converting digital data to pictures took as long as 24 hours, the company said.

A 1,024 by 1,024 point matrix is used to produce a resolution array of more than a million points. Each point has 64 separate intensity levels, which, the

company claims, combine with the high resolution to provide the most accurate soft copy image in existence.

The image on the CRT reportedly resembles that of a television set. But the company claims that the Dicomed 30 surpasses TV in quality. TV flickers and fades because of the continual flow of data needed to display a picture. The Dicomed 30 retains a stable image until erased upon command of the

operator, the firm said.

The image stability is the result of the use of a CRT with dark-trace phosphor. Unlike normal phosphors, the image generated does not fade or blur and can be retained accurately almost indefinitely. In tests, the company said, images were retained on the tube as long as two months.

Erasing is performed by a thermal process. Filaments behind the target area of the CRT are heated. The heat is then

transferred to the target area to neutralize the image.

According to Dicomed, a Photomation system using the Dicomed 30 is in use to reproduce and enhance X-ray negatives. This is an experimental technique that would enable radiologists to extract more information from an X-ray image, and increase the accuracy of interpretation, the company said.

The digital values resulting from the action of the digitizer can be sent from a remote location to a central point where a computer and a Dicomed 30 are located. The resulting 6 million bits would take about 1-1/2 hours to transmit over telephone lines at existing transmitting speeds making the process practical only for unusual applications.

The Dicomed 30 display has been priced at \$15,000 and the digitizer at \$35,000. Customer deliveries are scheduled to begin July 1, 1970 on a 60-90 day delivery schedule.

The Dicomed Corporation is at 4600 W. 77th St.

Last year this ad offered you the best time-share buy on the market.

Now we've got an even better deal. Our new system handles twice the users for just \$3117 a month.

Last year, we had one Time-Share system that made a lot of sense to a lot of people. Now, we've got two! Our new HP 2000B System does an even better job of holding the line on rising time-share costs. It handles 32 users simultaneously. Twice as many as its "little brother" (HP 2000A) — for only a third more cost.

Of course, if you already have a 2000A (or only need a 16-terminal system right now), you can upgrade to 32 terminals any time you're ready. Either way, you'll still have the best time-share buy on the market.

Both systems provide the advantages of HP BASIC, easiest programming language around. More scientists, engineers, educators and businessmen are using it every day. To make the 2000B even more useful, some new language features have been added. Like chaining (where one program calls in another automatically). Common storage for simplified programming. And doubled data file capability, for access to 16 files simultaneously.

Sound good so far? Here's more. Our 2000B, complete with custom software, control teleprinter and all 32 terminal interfaces, costs just \$119,900. Or \$3117 a month on our four-year lease plan. And if you want to start with a minimum investment, our HP 2000A is still only \$92,000. And don't forget what we said about upgrading!

For all the details, contact your nearest HP computer specialist. Or write to Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

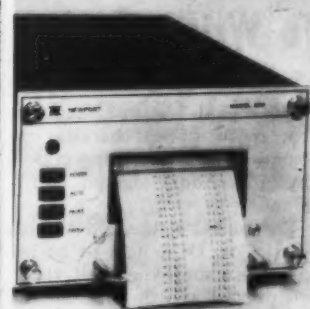
For the full story on all our computer products, visit us during SJCC at Booth 2400, Convention Hall, Atlantic City.

HEWLETT  PACKARD
DIGITAL COMPUTERS

Printer Handles 168 Line/Min, In Red or Black

SANTA ANA, Calif. — A digital printer priced at \$895 with two-color printing of up to 21 columns of BCD input data is being offered by Newport Laboratories, Inc.

Designated the Model 800 Data Printer, the device can handle a line of data (every 360 msec or 168 line/min) controlled by external command or an optional,



Model 800 Data Printer

internal rate-selector for slower rates. The numerals 0 through 9 plus six other characters are provided in the symbol set.

Red or Black

Red or black printing is selected by external logic-level. Decimal-point location and character deletion are automatically controlled, the company said.

Inputs are compatible with standard DTL and TTL logic levels. Special data logic levels may be accommodated as an option. Other options include input storage and digital clock printout. An analog to digital converter can be supplied to convert analog voltage or current to BCD outputs for printouts. Parallel register output is in BCD code.

Delivery is 60 days. Newport Laboratories, Inc. is at 630 E. Young St.

Unit Prints Analysis Data in 2 Modes

CHERRY HILL, N.J. — A printout unit is being offered by Computer and Programming Analysis, Inc. for use with its line of Model 7700 computer performance analyzers (CPAs). Identified as the Model 7721 Output Printer, the unit prints analysis data in either of two modes — tabular digital or graphical output — and reportedly eliminates the need for attended operation of the analyzer.

The Model 7721 consists of a universal buffer control which interfaces the system to the analyzer; a printer control unit which generates characters and format information; and a unit based on the National Cash Register EMT-1 nonimpact printer which provides 80 columns of printing on an 8-3/4 in. roll of paper at 30 char/sec.

Controls and format electronics to match the interfaces of the universal buffer control and the printer are provided in the printer control unit.

Analysis data relating to such computer functions as CPU utilization and system wait state are printed in block readout format from 6, 12, or 18 counters (depending on which analyzer model is used), at frequency intervals of 36 seconds, six minutes, or one hour. Blocks of printing are also executed upon turn-off or shutdown of the system, the company stated.

dp accessories

Variable Data Recorders Used To Write Checks

CLEVELAND — Five- and seven-digit variable data recorders for optical character recognition input are being offered by the Addressograph Multigraph Corp.

The units feature bed layouts that allow OCR data to be imprinted approximately three-quarters of an inch from the top of a tab-card form. The data



7-Digit Variable Data Recorder

recorders can imprint from varying thicknesses of plastic cards, and a choice of four stub widths and three OCR type fonts are available.

The units are for applications such as check writing, issuing receipts, and for writing drafts and warrants.

The five-digit variable Data Recorder, Model 12-85-60, sells at \$176. The seven-digit-variable Data Recorder, Model 12-87-60, sells at \$187. Delivery is nine weeks.

Addressograph Multigraph Corp. is at 1200 Babbitt Rd.

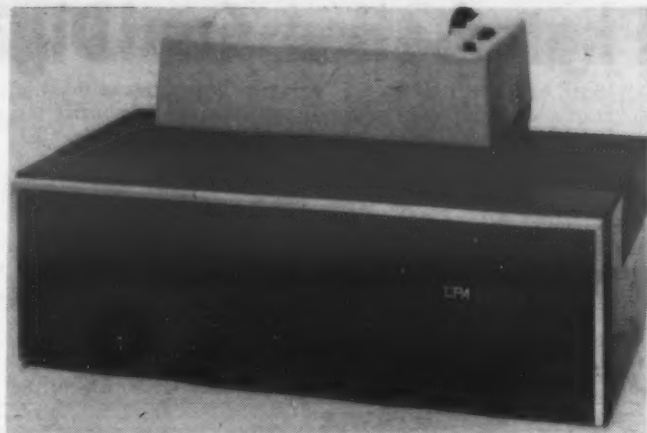
Printing outputs provide the user with four-digit readouts on a percentage basis of the counters working either in time mode or the actual count of counters working in occurrence mode.

The graphical format provides a histogram of the function being monitored to a resolution of approximately 3%. Up to 18 different functions can be monitored simultaneously with the analyzer without interfering with computer operations, the company stated.

As the system is monitored, each print block is preceded by a real-time clock reading showing the day, hour, and minute of the test interval. Once the clock is started, it continues to accumulate and record real-time until power to the printer is terminated.

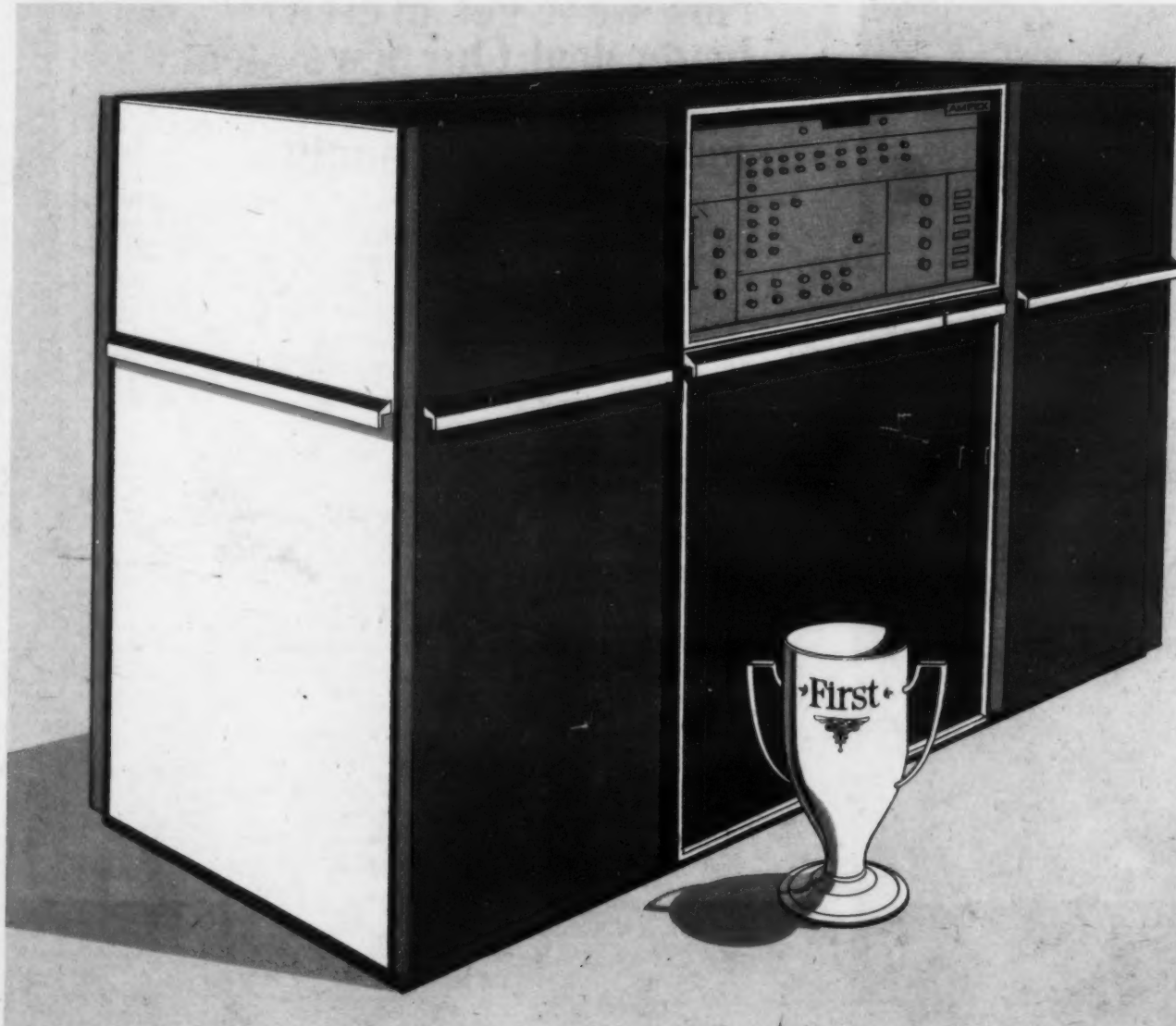
The price of the CPA 7721 output printer to attach to a Model 7712E computer performance analyzer is \$9,430.

Computer and Programming Analysis, Inc. is at 1103 Kings Highway North.



Model 7721 Output Printer used in conjunction with a 7700 computer performance analyzer.

Speed merchant.



Ampex Extended Core Memory multiplies throughput on IBM 360's.

Plug in an Ampex ECM to a 360/50 and get almost twice the speed of a 2361 LCS. And even greater speed on a 360/65. Interleave two ECMs and effective throughput can be doubled again. It gives you more time to use for more data processing.

The Ampex ECM is a direct replacement for the IBM LCS. Just plug it in. Absolutely no modifications are required. Mechanically or electrically. And it is completely compatible with existing software.

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See for yourself. Ask for a complete list of operational sites.

For fast information, contact: Ampex Corporation, Computer Products Division, 9937 W. Jefferson Blvd., Culver City, California 90230, a leading world source for core memories, tape memories, cores, stacks and arrays. Telephone: (213) 836-5000.

Your computer counts on us.

AMPEX

These Students Trust Computers, Call Them Reliable

By Harvey Elman
CW Staff Writer

PALO ALTO, Calif. — A Stanford University educator has found that a group of junior high students aged 13 to 15 associate the computer with such human qualities as trustworthiness, reliability, veracity, and fairness. The study further indicates that the youths rate the computer as a "more positive source of information" than their teachers, textbooks, or television news reports.

Dr. Robert D. Hess, professor of psychology in Stanford Uni-

versity's School of Education, and a colleague, Dr. Maria D. Tenezakakis, tested students from disadvantaged backgrounds in neighboring San Jose.

Computer-assisted instruction (CAI), reported Hess, which is used to drill and practice in mathematics and reading in many U.S. schools, "not only transmits information to the students, but also affects their behavior in their private life."

Space Odyssey: 2001

The two researchers pose the possibility that computers can

be programmed to mislead, misinform, or politically indoctrinate

Education

just as well as they can be to produce strictly factual information.

"It's like the movie *Space Odyssey: 2001*," Hess noted. "Everyone holds in the back of his mind the possibility that a computer may turn against its human programmers, just like

the sequence in the movie where the computer wouldn't let the astronaut back into the space vehicle."

The fact that the research subjects were junior high students from minority backgrounds is irrelevant, the researchers emphasized. They theorize that their findings could be extended to all school youth of the CAI generation.

The Stanford CAI system used in the first grade reading program at Brentwood School, East Palo Alto, uses a computerized human voice to assist youngsters

in spelling simple words, which includes such comments as "fantastic" for a good performance.

The two educators report, "The school is fast becoming the major socializing agent for the pre-adult in American society, and as such it transmits to the child certain ways of orienting himself to the society, toward the authority of institutional representatives, and toward preferred ways of processing data and using it to relate to others."

One-Way Street

Another factor is that CAI is a one-way street. "The child has no way to talk back to the computer, any more than an adult has an effective way to correct an error in a computerized bill," said Hess.

"The use of technology in education," he continued, "and particularly that of the computer for instruction, will continue to expand. Thus the adaptations that the child develops in his responses to machines become of special interest."

"These are crucial aspects in the socialization of the child into modes of dealing with an industrial highly technological society. The points of contact between the child and the institutions of society will be increasingly mechanical. Thus the machine takes on the role of an authority figure."

And it doesn't seem to make much difference, he noted, that the children know that the computer was programmed by a human, teacher or otherwise. Their faith remained unshaken.

He plans further research on parental attitudes toward the growing influence of machine technology in education and society-at-large, and also into the roles that age, sex, IQ, socioeconomic status, and ethnic background play in the child's image of the computer.

IBM Grant Gives Underprivileged Students Tutors

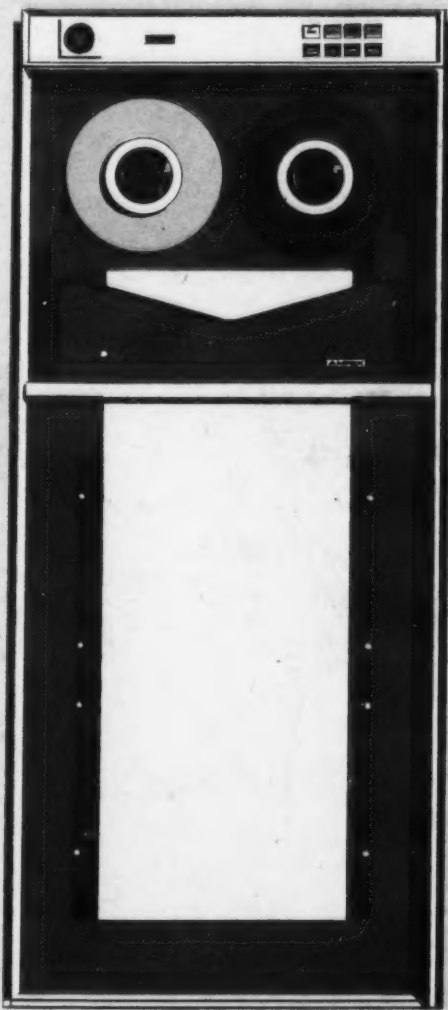
LOS ANGELES — A \$68,000 grant from IBM intended to provide more tutors for special low-income, minority student programs at 10 state colleges was announced by Glenn S. Dumke, Chancellor of L.A. State College.

The grant will generate an additional \$272,000 in federal work-study funds and the resulting total of \$340,000 will enable the colleges to hire more tutors for low-income and minority students who require special assistance.

The money will be spent at 10 colleges chosen because they are located in areas with sizable minority populations: Dominguez Hills, Los Angeles, Fresno, San Fernando Valley, Sacramento, San Bernardino, San Diego, San Francisco, San Jose, and Long Beach.

The IBM grant "represents a greatly appreciated recognition within the private sector of our economy of the need for encouraging and supporting economic opportunity students in the pursuit of their higher education goals," said Dumke.

Perfect match.



Ampex TM-1624/29 tape drives are plug-interchangeable with IBM 2401's and 729's.

In fact, the Ampex TM-16s are compatible in every way—size, hardware, software, diagnostics and operator interface. Just plug them in and start operating. The TM-16 single capstan drive

assures gentle tape handling and easy loading.

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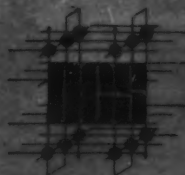
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You... and your clients... can jump on and off-line... casually... in ways that were never possible before. In expanded FORTRAN IV-H. In COBOL-65. In Extended BASIC.

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Davis Computer Systems, Inc.
280 Park Avenue
New York, New York 10017
Tel.: (212) 867-6406

In-House Training**Video-Assisted Instruction
A Boon to DP Education**

By Harvey Elman
CW Staff Writer

MOUNT PROSPECT, Ill. — Video-assisted instruction as a means for in-house programming training is becoming increasingly popular, and "may be compared to programming instruction as an emulation of a live course at the same cost," according to Frank Pinney of Advanced Systems Inc. (ASI).

His company's service provides customers with learner-paced instruction based on the following premises:

- Students are capable of learning at a much faster rate by themselves than in a controlled classroom environment.

Education

- The lecture method is not always the most effective method to use because it does not consider the student's attitude; all teachers are not equally effective in their methods of presentation; and a large group is usually involved, thus minimizing the amount of personal attention which a teacher may give to a student.

10 Lectures

A student guide directs students step by step through the material — alternating from a series of 10 videotaped lectures to programming instruction (P.I.), to supplemental reading assignments, to practice exercises, and to final exams. These videotaped lectures vary in length up to 30 minutes. The number of tapes for a course will

vary depending on the specific material to be covered.

The customer is provided with a video tape recorder, TV set, and videotapes as well as student texts and reference material. The tape teaches the student and also directs his next reading.

He can rewind the reusable tape to repeat lessons, pause, or spin ahead.

Locked in a Closet

"Many users had video equipment but it was locked in a closet," said Pinney, "however, video-assisted instruction applies to technical training with this software package. This is an entire course, not just an aid."

This form of instruction is designed to make P.I. material more interesting, to develop a more personal instructor-student relationship, to clarify the information contained in the P.I. texts, and to reinforce the subject matter. Additionally, courses have been developed in areas where P.I. material is not available.

A student may spend as much time as is needed in the class, supplementing his learning with video instruction at will. A typical lecture explains input-output, control, storage, and relationship.

"In an unbundling environment, this is a cost-effective way," noted Pinney. "No other known company or organization in industry prepares videotape training software acceptable for use across industry lines."

The video equipment, sold outright to the customer, serves as a training tool for ASI's major clients in the areas of banking, insurance, chemistry, manufacturing, and government.

**NSF Awards Residencies
In Computing Activities**

WASHINGTON, D.C. — The National Science Foundation has awarded nine one-year faculty residencies at Systems Development Corp. (SDC), Santa Monica, Calif., for training in computing and computer applications.

The residencies are intended to help institutions of higher education develop computing activities by providing advanced training to a faculty member of the institution's choice.

Participants will spend 12 months starting July 1, 1970, at Systems Development Corp. in a program developed by SDC to provide three major types of activities:

- Training in the fundamentals of academic computer service including equipment selection, customer-vendor relations and services, information sources, computing center objectives and procedures, and other related subjects.

- Seminars on the application of computers in social sciences,

physical sciences, and professions.

- Research in the participant's own area of specialization with a research group at SDC which is working in that field.

After completing the residency, the participant will be expected to return to his institution to help develop its computing activities. The maximum award for each school is \$50,000.

The participants were: Richard N. Carpenter, Antioch College, Yellow Springs, Ohio; Elmer B. Carter, Trinity University, San Antonio, Texas; James Farrell, St. Mary's College, Winona, Minn.; Joseph B. Frechen, St. John's University, Jamaica, N.Y.; Richard I. Miller, Baldwin-Wallace College, Berea, Ohio; Peter Perkins, College of the Holy Cross, Worcester, Mass.; J.H. Rowland, University of Wyoming, Laramie, Wyo.; Boyd G. Swartz, Monmouth College, West Long Branch, N.J.; and Walter A. Yungen, Willamette University, Salem, Oregon.

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and consulting firm in the computer industry.

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The new compact Cognitronics UNIT ROCR System/70 is an extension of Cognitronics Remote Optical Character Recognition (ROCR) operations. It's a complete, desk-size system for installation on your premises — featuring the same basic proven components employed in Cognitronics commercial ROCR service centers.

Now you have a choice. You can utilize the services of a Cognitronics ROCR Service Center — or — install the new compact UNIT ROCR System/70, with remote scanner capabilities, right in your office. A flick of the switch permits local or remote input.

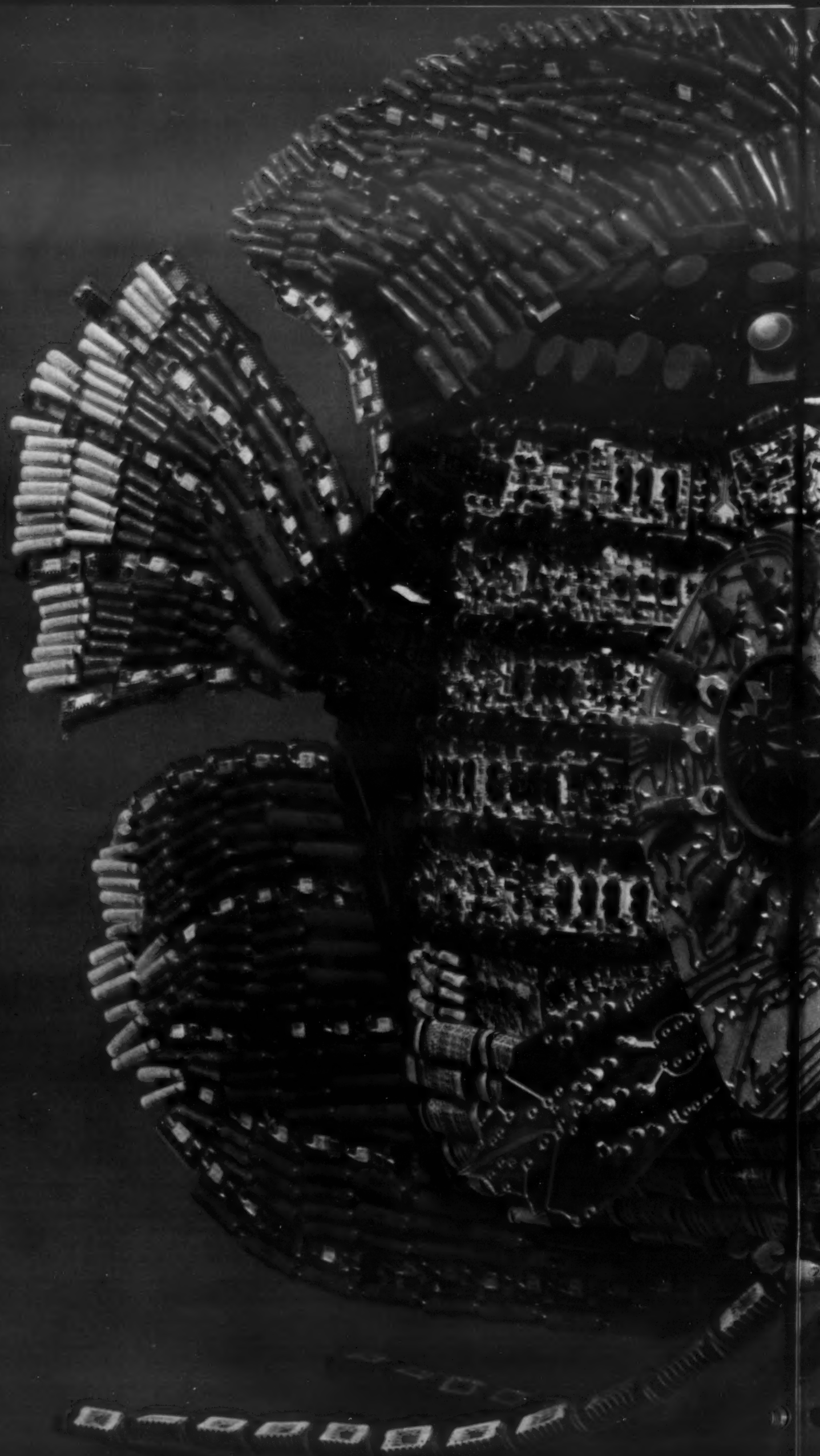
And UNIT ROCR System/70 also permits you to enjoy the advantages of Cognitronics Autoform System — pre-programmed forms which eliminate the need for programming each application separately. And permit processing of intermixed documents. Built-in checks and controls provide 100% throughput with virtually 100% accuracy.

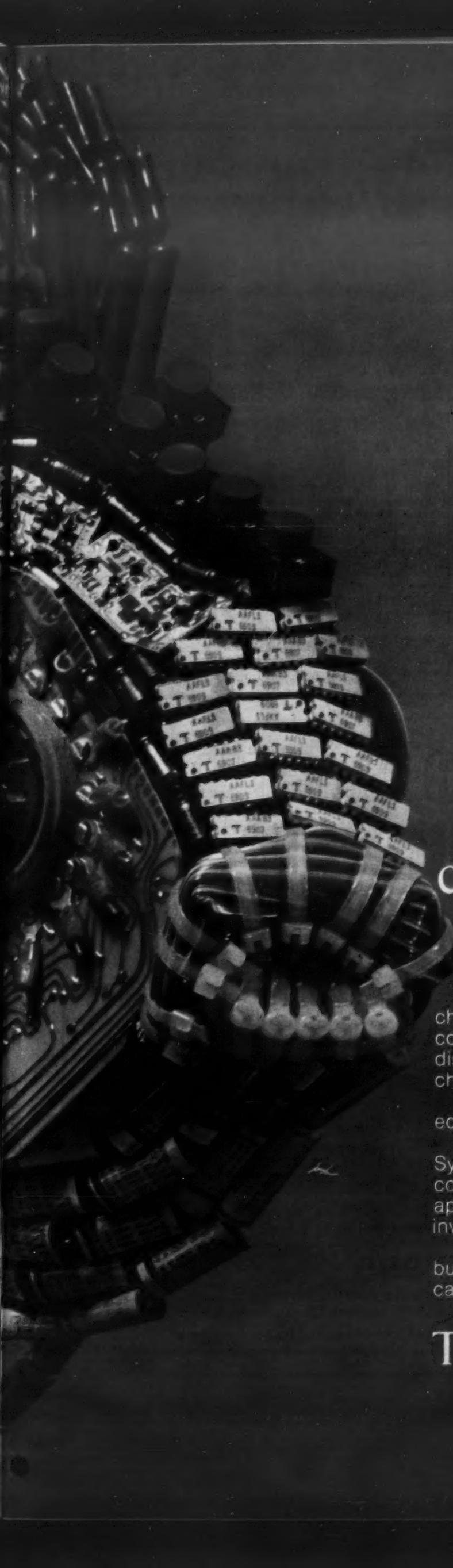
For full details about the new compact UNIT ROCR System/70, write or call today.

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Our new 115 disk computer combines the power of a shark and the price of tuna fish.

A regular bouillabaisse of performance features. It's a disk system with high internal speed, 16k to 32k characters of core memory, and integrated peripheral controls. For easy data storage and retrieval, high-up-time disk drives let you expand from 3.6 million to 36.8 million characters.

The 115 offers a full range of tape drives, printers, card equipment, and communication controls.

You can choose between the Disk COBOL Programming System and the Mod 1 Operating System. Both offer system control, language processing, and utility routines. Disk application packages provide things like accounting and inventory control. And memory overhead is the lowest around.

Like all Series 200 computers, the 115 comes completely bundled - with basic software, systems support and application packages at no extra charge.

Which can save you many clams.

The Other Computer Company:

Honeywell

New PL/1 Group Formed 'To Share Knowledge'

NEW YORK — Three area PL/1 users have formed a new organization to promote use of that language and to disseminate information about its capabilities.

Feeling that many significant PL/1 programming techniques are learned only after months or years of use, a spokesman for the group, David Bernstein of Advanced Computer Software Services, said: "It has such powerful capabilities in many respects that we felt there ought to be a way to share our accumulated knowledge."

There is no charge for member-

ship, he said, and no minimum hardware configuration requirement. The group plans to feature guest speakers at monthly meetings and to sponsor a newsletter for members and interested firms.

As yet, Bernstein said, no officers have been elected. Interested firms may contact him at 220 Park Ave., South, New York, N.Y. 10003.

One Bedroom House, Please
SAN ANTONIO, Texas — Computerized househunting will soon be inaugurated by the San Antonio Board of Realtor Multiple Listing Service.

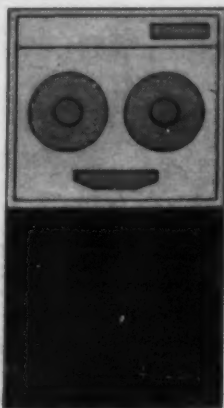
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COMPUTERWORLD

societies/user groups

Conversion Users Group to Meet in Texas

DALLAS — A new Conversion Users Group will hold its first meeting here May 19-20 to present and discuss topics of mutual interest to firms in the process of converting or planning to convert to a new brand or model of computer hardware, a new operating system, or a data management system.

Ten major industry speakers are slated to appear. They are: Kenneth Calhoun and W.C. Hanschek, Alcoa, Pittsburgh; Jack Troster and John Heft, Texas Instruments, Dallas; F.O. Parlova, 1st National City Bank, New York; R.A. Chambers, Associated Milk Producers, San Antonio; C.J. McGrillen, Spiegel, Chicago; R.P. MacRoberts, Pennzoil United, Shreveport, La.; David Benda, Baltimore Gas and Electric; and Murray Cumming, Safeco Insurance, Seattle.

Topics to be discussed at the first meeting include:

- Factors in the establishment of conversion budgets and sched-

ules.

- Personnel problems in converting.

- Review of types of conversion software available.

- Specific areas such as DOS, to OS, conversion problems, paralleling and testing aids, batch to teleprocessing conversion, installation conversion standards.

San Francisco to Host Sixth Aicpa Computer Conference May 18-20

SAN FRANCISCO — The American Institute of Certified Public Accountants' (Aicpa) sixth annual Conference on Computers and Information Systems, for CPAs engaged in or considering involvement with electronic data processing, will be held at the Jack Tar Hotel, here May 18-20.

This year's program is designed to meet the needs of individuals with varying degrees of familiarity with EDP.

Louis M. Kessler, president of Aicpa, will be the luncheon speaker on the opening day. Harold Weiss, director of the

Automation Training Center, will deliver the keynote address on "Reflections on Computers and Auditing in the 1970s."

Other speakers and their subjects include: Lawrence Welke, president of International Computer Programs, "Selection, Purchase and Use of Proprietary Software Packages"; Leonard Palmer, president of Computermin, Inc., "The Computer Service/Client Interface"; and Wendell F. Sayer, systems manager of the Galion Iron Works, "Accounting Output Via A Data Base — An Operational Management Information System."

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Portable 33-ASR
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MODEL 301A2-13

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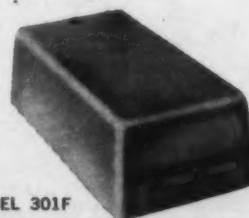
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Products on Show at Spring Joint



Shown in a system configuration with a System 21 data terminal is this model of Viatron's new low cost optical character reader. The new OCR line is priced at least 10 times less than other OCR devices now available.

Viatron OCRs Interface With System 21, Model 2111 Terminal, Need Special Font

BEDFORD, Mass. — Three optical character readers from Viatron are limited to a special font of characters and must be connected to the firm's System 21, Model 2111 terminal.

Reproduction prototypes of the readers will be demonstrated at Viatron booth 32000 at the SJCC.

Viatron said the readers are priced 10 times less than comparable OCR devices now available and are capable of reading variable-length records, up to 80 characters in length, one line per document, per pass. Reading rate is 80 character position/sec.

support to other organizations interested in building Viatron-compatible printers and recognition equipment.

In addition to its support of other typewriter and printer manufacturers, Viatron indicated it would shortly announce its own line of typing and printing machines.

Read logic for the Viatron OCR is provided by a hard-wired microprogram in the reader that recognizes all alphabetic and numeric characters, standard punctuation characters, and special control characters.

The control characters allow

characters may be stored on one reel of paper tape, according to Viatron. The Model 6101 is priced at \$2,400.

The Model 6102 OCR can read hand-fed documents varying in width from three to 11 in. and in height from 2-1/9 to 11 in. An optional feature allows this model to read paper tape and other documents as narrow as one in.

Maximum line length is 11 in. or 100 character positions within a two in. band starting .5 in. from the aligning edge of the document. Data position is a .25 in. path located anywhere within

ABCDEFGHIJKLMNOPQRSTUVWXYZ
_1234567890 \$@-!~&*~<~>~

Viafont is a man/machine readable code which includes all the standard alphanumeric and punctuation characters. It also provides special characters, featuring an over-print character for correcting typing errors, and a character which allows a typist to bracket any data not to be read as input.

The special font, Viafont-X, includes standard alphanumeric and punctuation characters. It also provides special characters, featuring an over-print character for correcting typing errors, and a character which allows a typist to bracket any data not to be read as input.

Viatron said that Viafont will be available, royalty free, to the industry. Currently, the font is available on Compugraphic film for photocomposition and is available from IBM, for \$18, on a Selectric typing element.

Viatron said that it is establishing a wholly owned subsidiary to license and offer engineering

for bracketing information, short records, space suppression, space insertion, and error correction through overprinting.

All OCRs interface with Viatron's System 21, Model 2111 data terminal through a standard data channel. Data read by the OCR can be recorded on Viatape cartridges or converted directly to punched cards or computer compatible tape. Optically read data can also be transmitted over regular telephone lines to a computer.

The Model 6101 OCR provides automatic feeding of up to 200-ft rolls of standard one-in. paper tape. More than 20,000

the read area. The Model 6102 costs \$4,800.

The Model 6103 OCR provides automatic loading, feeding, and stacking for up to 250 documents.

The Model 6103 will read a single line of information containing up to 80 characters. The documents may vary in length from 2.329 to 9.625 in., with a fixed height of 3.25 in., the height of a standard 80-column punch card. The Model 6103 will cost \$7,200.

Initial deliveries of the Viatron OCR are scheduled for the fall of 1970, according to Viatron. Viatron is on Route 62.

Tape Transports Handle Three Reel Sizes and Several Track Formats

SAN DIEGO, Calif. — Cipher Data Products has announced a new line of continuous transports with limited electronics.

The line includes the Series 0700, with 7 in. reels, the Series 0800, with 8-1/2 in. reels and the Series 01000, with 10-1/2

37-1/2 in./sec are available.

Features include 180 degree wrap-around capstan, mechanical read azimuth adjustment, electronic write head deskewing, tape cleaner, solenoid-operated file protect, optical compliance arm sensors and reel motor fail-safe brakes.



Cipher Data Products' Series "O"

All models are presently available in both 7- and 9-track. The 7-track is offered with selectable densities of 200, 556, and 800 bit/in. and the 9-track with 800 bit/in.. Both models are available with read/write or read-after-write heads. Tape speeds up to

Single quantity prices for the Series 0700 are \$2,750 for the Model 0707-1 7-track; or Model 0709-1 9-track read/write and \$3,500 for the Model 0707-2 or 0709-2 read-after-write.

The complete series will be displayed in SJCC booth 26001.

General-Purpose Datamate 70 Has 11 Registers, Set of 144 Operations

BIG SPRING, Texas — The Datamate 70, from Datamate Computer Systems, Inc. will be introduced to the data processing industry at the show.

The Datamate 70 is a general purpose, 16-bit word minicomputer for data acquisition, process control and monitoring, instrumentation and test monitoring, communications, and educational applications, according to the company.

The unit has 11 registers — four for arithmetic accumulators, two for index registers — and an I/O index register. Several memories are being offered from a 1 μsec core memory to read-only, and read/write semi-

conductor memories of high speed.

There are five classes of instructions, comprising an instruction set of 144 operations. Re-entrant code is possible with the available hardware instructions, the company claims.

Software will include an assembler, a symbolic editor, a relocating loader, I/O routines, diagnostics, and a debug package. Core memory ranges from 16K to 32K, read-only memory can be used up to 1K, and the read/write memory can be up to 256 words, plus space for I/O device control blocks.

The Datamate 70 will be on display in SJCC booths 1304-5.

Infotec DS-20 Forwards TTY Messages, Eliminates Need for Manual Operators

PLAINVIEW, N. Y. — The Infotec Data Station 20 (DS-20) is an automatic telecommunications switching terminal located at the central point of a teletype network. The DS-20 receives messages, forwards them to their destination, or stores them until they can be forwarded.

This is a task which until recently has been done by a large staff of Teletype writer operators. It quietly performs the work of 32 operators with drastically reduced speed, the company said.

Using a DS-20 can add new capabilities to an existing communication network, Infotec said. Stations which once could transmit only during certain hours can now transmit anytime during the day as well as receive. Using different types of printers, and computer business forms, a DS-20 can be used for order entry, invoicing, inventory control, payroll, telegrams, and information retrieval.

Because of a minicomputer heart, the DS-20 can check to see that the format of a message is correct, can add information to a message such as date, time

and origin, can answer questions such as current inventory and price, as well as store messages for hours or indefinitely. When called upon, the DS-20 can even

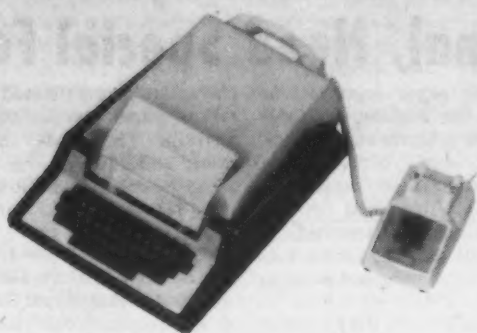
get answers from computers.

A DS-20 programmed for information retrieval is on display at the SJCC booths 6101 and 6102.



Infotec DS-20

Products on Show at Spring Joint



The CDI 1010 is TTY-compatible.

25-Pound Terminal Prints Up to Three Copies And Is Teletype-Compatible

CAMBRIDGE, Mass. — The CDI 1010, manufactured by Computer Devices, Inc., is said to be one of the smallest and lightest portable multiple copy printers available.

It was designed particularly for time-sharing and minicomputer applications. Measuring 14 in. wide by 18 in. deep and 67 in. high, the terminal weighs 25 pounds. Because the CDI 1010 is compatible with the Teletype Model 33 in code, format and

keyboard, there are no problems in substituting one for the other in a system, the company said.

The 1010 has a price of \$1,800. Other features include: an integral acoustic coupler, a simplified impact printing mechanism which consumes no stand-by electrical power and prints three copies, internal storage of fan-folded paper, electronic keyboard interlock and parity checking.

The design of the built-in

phone coupler, which incorporates special shielding, stable transmission frequency control, advanced filter design and vibration isolation, combines sensitivity and high noise rejection to permit error-free transmission even over telephone lines. Parity checking and electronic keyboard interlock eliminate operator errors.

The use of Ascii with 64-character set and a keyboard compatible with the Teletype Model 33 eliminates the need for computer reprogramming and personnel retraining, the company said. The page format, also compatible with the TTY 33, has 80 char/line.

Printing speed is 10 char/sec. Data transmission rate is 110 baud. The CDI 1010 operates in both half or full duplex modes. It will be on display in SJCC booth 10011.

Here's a remote batch data terminal with no "buts" about it. It's the DTS-100—a complete, programmable data processing system. It's designed for ready access to any large computer, no matter how far away. It transmits data at 2000 bps to 9600 bps. It reads up to 600 cards per minute. It prints up to 1000 lines per minute. In full or half duplex modes. Over common carrier or private lines. Dial-up or dedicated.

And, DTS-100 configurations are modular. Both software and hardware. Plug-in units make the basic terminal compatible with a

broad range of peripherals. And, capability can be increased simply and economically because the DTS-100 is upward expandable. To new peripherals technology. To improved software technology. To better common communications carrier offerings.

The computer-based DTS-100 is programmable. That makes it "intelligent." Because it is, you can select the computing power you want. From the central computer of your choice. Through operator program loading. Merely select the computer program, dial-up and get on-line. Change

peripherals as needed. Perform off-line data processing, too.

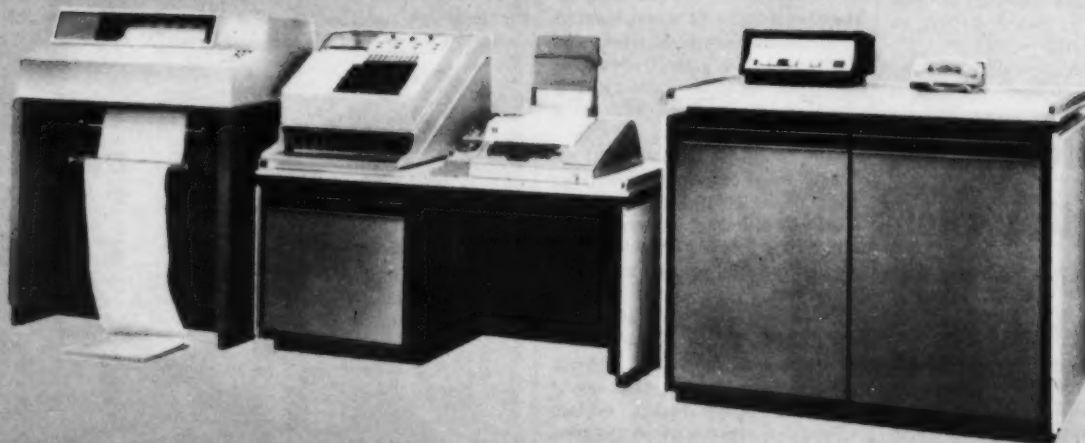
That makes the DTS-100 flexible!

In fact, it's so flexible that you don't really need your own computer. You use the DTS-100 where and when you need it. As a stand-alone processor. In remote batch applications. To communicate with the computing power you want. To talk with other remote terminals. That's its job.

It's an "intelligent" computer extender!

Besides, it costs a lot less to use. That's the name of the game.

Introducing DTS-100 the "Intelligent" Computer Extender!



DTS-100 has been selected as the official SJCC registration processor. See us on-line at Booths 1510-1511 in Atlantic City.

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a division of Budget Motor Manufacturing Company

Datacomp 404 Is Center of General Accounting Group

SAN GABRIEL, Calif. — Both a small, automated typewriter system and a complete book-keeping system built around the new Clary Datacomp 404 will be on exhibit in the company's SJCC booth.

The 404 is set up for code conversion and formatting, with decimal arithmetic, word lengths of from 16 bits to 64 bits, and 16 addressing modes.

Basic software includes an assembler for relocatable machine code, a tape editor, diagnostics, and a small time-sharing executive.

Built Around 404

The Datacomp 2.0, an automated typing system for general business accounting functions, is built around the 404. The system includes an electric typewriter and a Hermes front-feed form handler that accepts ledger cards or other business forms from the operator's position.

The Datacomp 3.1 is a general-purpose accounting system for small businesses. The 3.1 includes the equipment of the 2.0, and adds magnetic card handling. The system processes letter writing, accounting, master file maintenance, sorting, mailing labels, and payroll. The first 3.1 is to be installed this June, the company said.

The 404 can act as a time-sharing system for up to 16 users. It can also act as an intelligent terminal, when connected to larger systems. The magnetic card or tape capability give the unit a local I/O speed of 150 char/sec. An optional display and a cassette tape system are available from the company.

Clary will exhibit in SJCC booth 28500.

We specialize in tough customers.

Graham performance softens 'em up.

You know who we mean — the guys who buy tape as a means to an end. The people who read the specs, look at the tape, and then say, "Prove it!" The really tough customers.

They're the people Graham tape was made to please.

The tough customers buy Graham, because it's the world's

first Zero Defects tape.

The tough customers buy Graham, because it's the tape that exceeds one million passes on CDC 680 certifiers, *with no permanent errors.*

The tough customers buy Graham, because *we certify every reel.*

Think you're tough? We

hope you are. And we hope you'll try our tape, just once. Because once you see Graham perform, you'll be *real* tough on anything else.



**GRAHAM
MAGNETICS**

means to an end.



Products on Show at Spring Joint

A Peripheral That Sorts

ANAHEIM, Calif. — The peripheral that's a complete computer, at least for record sorting, will be the star in the Astrodata SJCC exhibit.

The electronic sorter accepts data over a selector channel, sorts it in appropriately-sized blocks, and then merges the blocks into a sorted file.

Other products from Astrodata will include a computer-controlled communications switching system, analog/hybrid computers and interface systems, data acquisition and control systems, and conversion systems.

The company will be in SJCC booth 3400.



Astrodata's Electronic Sorter acts as a self-contained computer system for record sorting.

Infonet Makes Nationwide Time-Sharing Available

CENTURY CITY, Calif. — Computer Sciences Corp.'s exhibit will concentrate on the company's new Infontet service.

Infontet, a nationwide network of time-sharing services, provides three services on one system. Basic offers the capability of problem solving and application development, in a conversational mode. Remote Job Entry provides a Univac 1108 for batch programs controlled, entered, and printed on a user's terminal. Conversational Remote Job En-

try provides both the conversational capabilities of Basic and the high-speed at lower cost execution of remote batch.

The Infontet library includes many applications: structural analysis, coordinate geometry, electrical engineering, statistics, finance, mathematics, biomedicine, Pert, and tools for Basic program development, the company said.

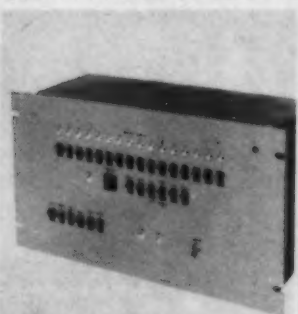
CSC will be exhibiting in SJCC booth 2200.

PAC Controller Is Programmable

PLAINVIEW, N.Y. — The Varisystems Corp. PAC-16 Stored Program Controller is a byte-oriented minicomputer with a repertoire of instructions for inputting, storage, manipulating, and decision making. The unit will be shown at the SJCC.

The PAC-16 is a low cost, digital controller which is adaptable to system interfacing requirements. Thirty-five percent of available logic space is reserved for customer logic requirements.

Each instruction is stored in



The Varisystems' PAC-16 is a minicomputer system controller for \$3000.

two 8-bit bytes, giving an instruction length of 16 bits. Since the operation code portion of memory referencing instruction requires only 4 bits, there are 12 bits remaining for addressing. As a result, 4K bytes may be referenced directly, without recourse to paging schemes.

The price of the controller with 1K by 8 of core memory is \$3,000 with the 4K by 8 at \$3,850.

The system is to be displayed at SJCC booth 50015.


Package Projects Profits

DALLAS — Logic, Inc. is offering a computerized actuarial projection of statutory earnings (Capex) to life insurance companies to analyze the profitability of various lines of business and to project earnings by company as well as by agency.

Logic, Inc. is at 264 Meadows Bldg.



All you need
to take our
data transceiver

anywhere at all
is a  dime for
the telephone.



Execuport 300

Products on Show at Spring Joint



The Scan-Data Model 200, on exhibit at the SJCC, leases for under \$4,000 per month. The operator at the keyboard terminal is entering a copy correction displayed on video monitor.

OCR Page Reading System Reads OCR-A for \$4K/Mo

NORRISTOWN, Pa. — An on-line demonstration of a multi-font OCR page reading system highlights Scan-Data's exhibit at the SJCC.

The Model 200 system is said to be the lowest cost page reader in its performance range. In its basic configuration, the system reads OCR-A. But it can be field upgraded to read as many as four additional fonts, including upper and lower case OCR-B, handprint, pica, 1403 edit symbols, and mark sense.

Monthly rentals for the system start at under \$4,000, according to the company. Reading rate of the system is 400 char/sec and an on-line copy correction capability is also offered.

The Scan-Data exhibit is in booth 31000.

Axicom Systems To Demonstrate EDP Capability

PARAMUS, N.J. — Axicom Systems, Inc. will be demonstrating the company's total EDP services capabilities at the SJCC.

Axicom offers a range of capabilities from consulting to facilities management and all related EDP services. The services are backed up by Axicom's 1108 Exec 8 computer center at the company's headquarters. Axicom has remote terminal centers in New York, Washington, D.C., and Princeton, N.J.

A 30 char/sec communications network, Axicom-30, will be utilized in demonstrations at the show. The Axiplot service, a high-speed, remote interactive plotting system, will be on-line with the computer center. Axicom will be demonstrating several new remote devices capable of utilizing the high-speed communications network.

Axicom is in SJCC booths 4605-6.

Data Gain Packages Remote Data Entry

HOUSTON, Texas — A display of the entire series of Data Gain data communications equipment will be exhibited at the SJCC by Applied Peripheral Systems, Inc.

The Data Gain series consists of related products designed to communicate between remote data entry locations and central computer sites. These devices offer a low cost method of data preparation directly from source documents to magnetic tape, including data transmission capability, the company said.

A variety of data collection systems can be configured from Data Gain equipment, including adding machine input to magnetic tape cassette, cassette to tape telephone communication, tape to tape communication and teletype interfacing.

Data Gain devices will be displayed in SJCC booth 1441.



The Data Gain Communications Equipment Family



...the portable one!

Wherever business may take you, take along your Execuport 300. It's your indispensable link with the home-office computer.

Execuport 300 is the thermal page-printing data transceiver that's ready to go to work anywhere.

It's a high-speed printer: The operator selects 10, 15 or 30

characters per second. It's so quiet that all you ever hear is the unobtrusive tapping of the print-head. Solid-state circuitry promises a new level of maintenance-free reliability.

And Execuport 300 is the portable one. Keyboard, thermal page printer, solid-state control logic, telephone coupler, data

access jack and interface, plus a universal interface for peripheral accessories — all components are enclosed in an attractive, integral carrying case.

Total weight is about 27 pounds. Including the dime for the telephone.



COMPUTER TRANSCIVER SYSTEMS INC.

317 Route 17, Paramus, New Jersey 07652

To see and hear for yourself, visit Booths 203-204-205 at the Spring Joint Computer Conference in Atlantic City, May 5-6-7.

**It's new.
It's fast.
It's Varian's 620/f.**

Varian Data Machine's new "superfast" computer has a 750-nsec cycle time. That means it executes two and a half times faster than the well known 620/i.

And check these other outstanding features:

- 100% upward compatible from the 620/i.
- All 620/i software executes on the 620/f — you can take advantage of the extremely large library of software field-proven on the more than 1,200 620/i's in worldwide use.
- Fastest I/O in minicomputers.
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- Read-only memory.
- All 620/i peripherals plus a new low-cost line.

For full details, request the new handbook. The 620/f — another

development that keeps us the big company in small computers.

U.S. Sales Offices: Downey, San Diego, San Francisco, Calif.; Washington, D.C.; Atlanta, Ga.; Chicago, Ill.; Waltham, Mass.; Ann Arbor, Mich.; Albuquerque, N. Mex.; New Rochelle, Syracuse, N.Y.; Fort Washington, Pa.; Dallas, Houston, Tex. Other offices worldwide.

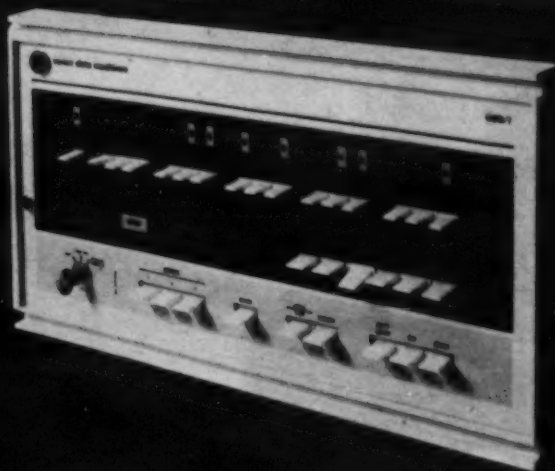
Varian Data Machines, a Varian subsidiary,
2722 Michelson Dr., Irvine, Calif. 92664.
Telephone 714/833-2400.



**varian
data machines**

The Big Company in Small Computers

See the 620/f at the SJCC Booth 3004.



Products on Show at Spring Joint

CD 12/14 Disk Is 2314-Compatible

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) is displaying a complete cross-section of special-purpose and standard peripheral equipment at the SJCC.

Leading the show will be the new CD12/14 disk storage system. The system is compatible with the IBM 2314, and is available with one to nine disk drives and the central controller. Such features as variable record length, record overflow, and file scan are standard, the company said.

Next on the list comes the new computer output microfilm system (COM). The COM acts as a complete graphics printer as well as a character printer. The printing throughput rate is claimed to be at 7,000 to 12,000 line/min. The plotting speed is rated at 500,000 increment/sec. The Model 1670 uses the Calcomp 900 computer as a graphics controller.

Combining the 900 graphics controller with a Model 937 Tape Unit, and a Model 1136 digital incremental drum plotter with three-pen plotting head, Calcomp has produced a high-speed, hard-copy graphics output system for the show. The system includes graphics software for the 900.

The company is also debuting a new disk drive, the CD1, which stores up to 58-million bits on removable disk packs.

Two of Calcomp's plotters will be displayed this year. The

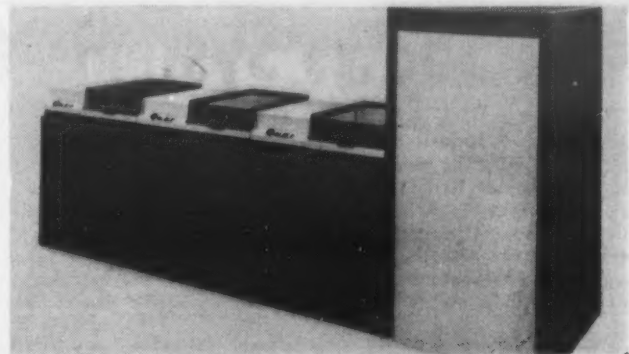
"four-pen" Model 718 flatbed plotter with a 54- by 72-in. drafting table has a "zip mode" for high speed drawing.

The Model 763 drum-type digital plotter can be used either on-line or off-line as a high-speed plotter. This plotter, too, offers the "zip mode."

In addition the company is displaying its Punchmaster, a new automated control to assist in converting source data into

punch cards. The Punchmaster may be connected to any IBM keypunch or verifier. It offers a buffer that lets an operator keypunch and verify at operating speeds, a 22-format program memory, automatic left-zero fill with or without a two-field accumulator, and operational instruction display for operator training.

Calcomp is displaying its products in SJCC booth 5200.



CD12/14 Disk System — IBM 2314-Compatible



If you're waiting
for GraphiCOM,
make do with:

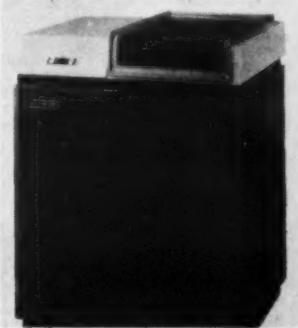
3 high-speed line printers
3 tape drives
1 computer
4 flat bed plotters
6 typesetting machines

If you're not waiting
for GraphiCOM,
you should be.

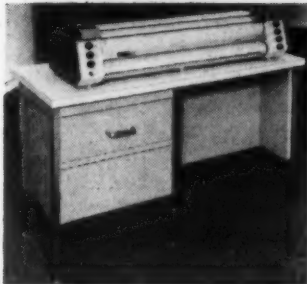
Write for our brochure
and we'll tell you
all about it.

Scan Graphics

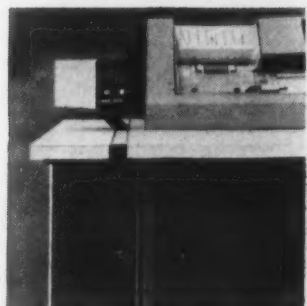
104 Lincoln Avenue
Stamford, Conn. 06902



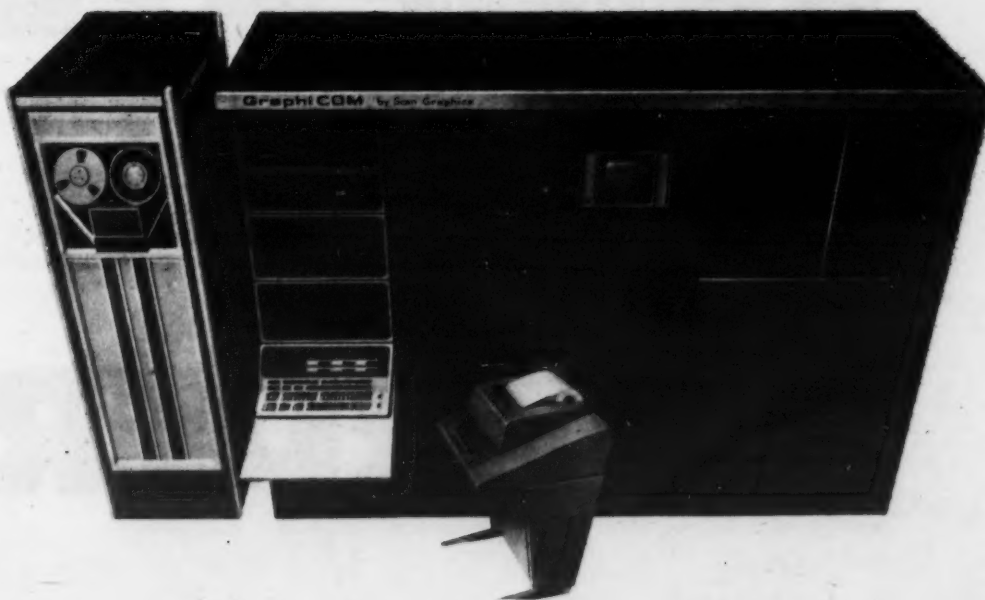
CD1 Disk Drive



Model 763 Drum Plotter



Punchmaster Data Entry System



Products on Show at Spring Joint

ADR Shows Systems Measurement, Data Management

PRINCETON, N.J. — Applied Data Research intends to have displays showing the capabilities and functions of its many software packages at this year's SJCC. Some of the company's packages range from flowchart systems to data accessing systems.

System Analysis Machine

The System Analysis Machine (SAM) provides reliable simulation of digital computer operations. It includes a dynamic programming language of its own to facilitate analyzing and evaluating existing or proposed software systems and hardware configurations, the company said.

The system generates analytical reports which supply the necessary data to optimize current operations or predict future performance prior to initiating costly implementation efforts.

According to Systems Analysis, all evaluations and calculations are the result of a discrete step simulation, rather than the probabilistic approach utilized by many other similar systems, thereby increasing the reliability of all output from the System Analysis Machine. SAM can construct a model of any digital computer system (ranging from a single CPU-single program mode through multiple CPU-multiprogrammed systems), the

company said.

Librarian

The 360 Librarian is a tool to assist a programmer in coping with the numerous problems of source program retrieval and maintenance. The Librarian can update, store, maintain, document, and execute any 360 source program, the company said.

Protective features built into the system reduce the human error factor in program handling. Computer-generated listings provide hardcopy records of all modifications and reflect the current status of any source program to extend management

control over large or small programming efforts.

The Librarian will handle all aspects of source program maintenance and manipulation easily, efficiently and economically. Operational under DOS and OS, it is designed for use on the IBM 360/25 and up. The lease price is \$3,600 for the three-year period.

Star

Star (System for Telephone Administrative Response), is a complete hardware/software package for monitoring a user's effectiveness in providing satisfactory customer service. Star collects, organizes, and analyzes data concerning the telephone

response being provided by a user, which is useful in evaluating current operator performance and predicting future staffing requirements.

Any present user of Fads or Bell Telephone's ACD system is a potential user of Star, according to Applied Data.

PI Sort

PI Sort is a sorting system for the IBM 360. PI Sort can operate at twice the speed and with twice the sorting capacity of its functional equivalent, IBM's DOS sort program, the company said. PI Sort eliminates the need for costly tape merges, cuts disk working space in half and generally improves turnaround. PI Sort can be operated in the foreground or background and supports 2311 and 2314 disk drives. PI Sort is available at a lease price of \$200 per month.

IAM

Interactive Algebraic Manipulation (IAM) is a system designed to reduce the amount of user effort required to perform the more complex and time-consuming algebraic computations. IAM currently operates on a DEC PDP-10 and is essentially a computer tool for scientific, mathe-

(Continued on Page 35)

Incremental Tape Recorder Reads Either 7-Track or 9-Track Tape

NORWALK, Conn. — Datran Corp. is introducing an incremental tape recording unit for the SJCC.

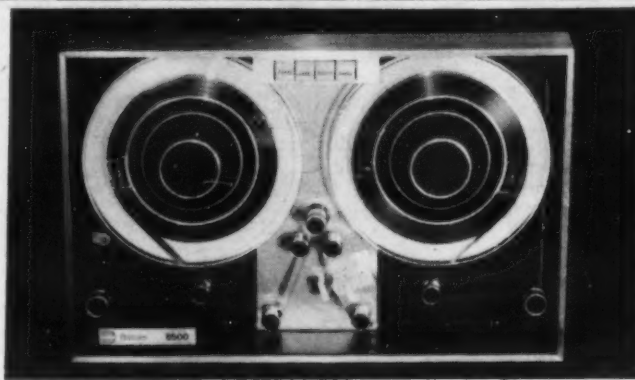
The Model 8551/8552 incorporates multimode drive for incremental reading, incremental writing, and slew-mode (standard) reading.

The 8551 is 7-track, while the 8552 is 9-track compatible with

IBM equipment, the company said.

Three densities, 200, 556, and 800 bit/in., are offered in each unit. Standard interblock gaps and parity, and data checking bits are generated with either odd or even parity.

The SJCC booth number is 6109-10.



The Datran Model 8551/8552 incremental tape drive

**MAKE
YOUR
COMPUTER
WORK
A BIT
HARDER.**

Products on Show at Spring Joint

Graphics Terminal Uses Joystick

BURLINGTON, Mass. — Computervision Corp. will display an interactive graphics terminal with a joystick control and a daylight-loading photoplotter with programmable exposure

control.

The Interactgraphic terminal system includes a 6-3/8 by 8-1/4 in. storage tube display, a 58-key data entry keyboard, a joystick-controlled cursor, a 34 by 44 in.

plotter/digitizer that prints at speeds up to 9 in./sec, and a basic software package called CVL-1.

\$9,500 for Software

The basic terminal system sells for \$47,500. The software sells for \$9,500. Options include a \$3,000 30 char/sec thermal printer, a \$500 16-key function keyboard, and a \$1,000 interface for the Compucircuit photoplotter.

The photoplotter offers a 15 by 15 in. image plot and is loaded by cassette. The basic version, which works with the Interactgraphic terminal, sells for \$34,500. Basic software included offers machine-control subroutines accessible from Fortran IV, exposure control, linear and circular interpolation.

Four Models

Four models of the photoplotter are available, the basic model, the 100-1, sells for \$34,500. The top model, the 100-4, sells for \$52,200. The 100-4 offers serial Ascii interfaces, 300 to 1,200 baud communications.

The graphics systems will be displayed in SJCC booths 13015-6.

Applied Data Research Displays Compatible Range of Software

(Continued from Page 34) testing, and maintenance, Applied Data said.

mat and engineering applications.

Roscoe

Roscoe is an on-line terminal proprietary software system which extends the capabilities of IBM 360 OS to users of remote devices. It simultaneously can accommodate OS batch processing and remote access capabilities.

The basic package consists of remote data set maintenance facilities and conversational remote job entry. An extended package permits interactive execution of problem programs.

A specialized package also is available which includes Cobol-oriented debugging features. Roscoe is a "program check-out" system which represents a conversational, language independent approach to assist in solving problems involved in source program preparation,

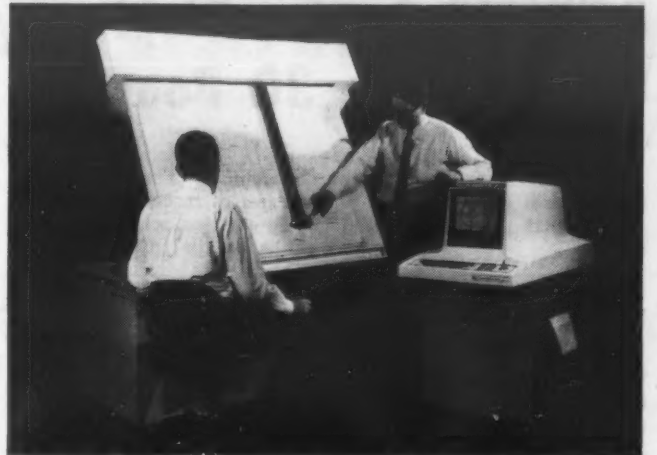
Autoflow

Autoflow is not only an automated flowcharting system, but a documentation and debugging tool.

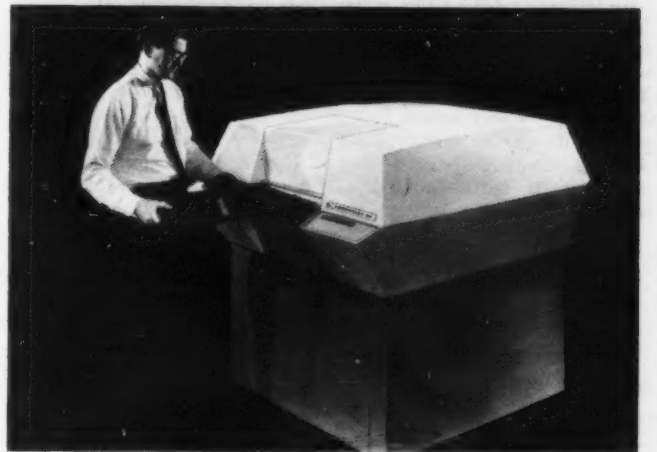
According to the company, Autoflow automatically produces accurate and standardized two-dimensional flowcharts of Cobol, Fortran, PL/I, or Assembly Language programs.

No additional programmer effort is required. Auxiliary listings further enhance the value of the output as programming and debugging aids. Already in use at over 1,000 installations throughout the world, Autoflow is available for IBM 360, 1401, 7090, H-200 systems, and RCA Spectra systems.

ADR will exhibit in SJCC booths 4406-8.



The Computervision Interactgraphic I Computer Terminal



The Computervision Compucircuit 100 Photoplotter

Bit for bit, every computer counts for more when you take traffic control out of memory. Our L-64 is the communications controller that sorts out input, steps up output, saves up to 40% in overhead time and gives you new peak workloads from your CPU.

Get a line on the L-64. It's the only communication controller that lets you add one line at a time to your system. Line adaptor units are built in. Once you have 16 lines in operation, adding increments to 64 is a snap. Up to 256 lines in full set-up.

Fill up one unit, start another. Or add a full 64 at a time. You can go as high as 256 lines. Tied into any terminal. Anywhere you want. Whenever you want.

64 line capacity is for both synchronous and asynchronous communication. Synchro-

nous lines are double character buffered with a range of 2000 to 9600 bps. Asynchronous, character buffered lines go from 45 to 2000 bps.

The L-64 is an interface saving device. On any local hook-up, the lines run on VCA. If you're remotely interested, use EIA RS-232 interface. Take the optional automatic calling unit. Or the dual processor interface.

IDS L-64. Your computer can be hard core or hardly computing. The choice is yours. The choice is IDS.

For more information write or call
KDI Interactive Data Systems
17785 Sky Park Circle, Box AO
Irvine, California 92664, 714-549-3329



Products on Show at Spring Joint

1,024-Character Display Weighs Only 30 Pounds

HAUPPAUGE, N.Y. — A 30-pound portable CRT display terminal will be shown by Applied Digital Data Systems' at the SJCC.

The terminal displays up to 1,024 characters on a 5-in. CRT screen. It is compatible with

Teletype terminals, according to the company. The terminal can transmit or receive at either 10 or 30 char/sec, selectable from a switch on the front of the terminal.

This portable display terminal will be in SJCC booths 11011-13.

Telewriter Produces Hard Copy At 100 Word/Min, Costs \$35/Mo

BROOMFIELD, Colo. — An improved version of Electronic Information Systems' Telewriter will be displayed at the SJCC. Telewriter is a small (25 pound), quiet input/output device, which enables its user to communicate with a computer when and where it is most convenient, without disturbing others, ac-

cording to the company.

Due to its design, which replaces practically all mechanical devices with solid-state circuits, Telewriter is quiet in operation and occupies little space, the company said.

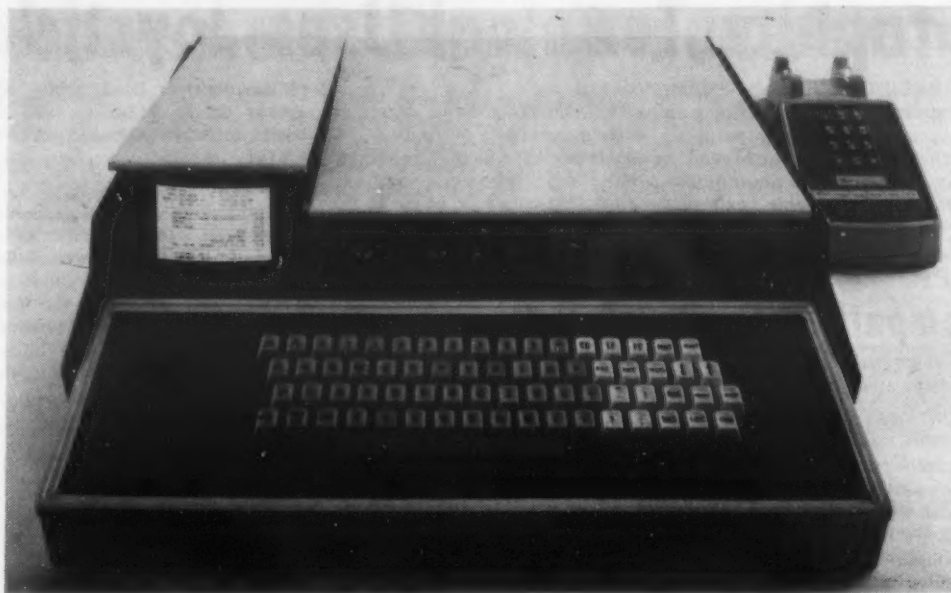
The Model ET 39A features a more compact paper-roll holder, and an optional attachment for direct interfacing with existing teletype installations. Another new option is a hard, contoured carrying case that meets airline carry-on specifications.

Telewriter can perform 10 operation/sec (100 word/min). Monthly cost, on a 36-month, lease-purchase plan, is \$35.00.

The ET 39A can be seen in SJCC booths 35006-7.



ET 39A typewriter/terminal



Portable 30 Char/Sec CRT Display Terminal

ICC Displays 3300/36 Modem On-Line

MIAMI — International Communications Corp., (ICC) a subsidiary of Milgo Electronic Corp., will go on-line at the SJCC with a demonstration of its 3600 bit/sec Modem 3300/36.

The new modem will be in operation linking a high-speed

terminal in the ICC booth in Atlantic City with a digital computer in New York.

Modem 3300/36 is capable of operating over standard dial-up telephone lines as well as unconditioned voice-grade leased lines, the company said. With a speed of 3600 bit/sec, it is said to

exceed the transmission rate previously available over the public telephone facilities.

Other ICC data sets to be displayed at the SJCC operate at speeds from 1,200 bit/sec to one million bit/sec and can be seen in SJCC booth 5900.

**MAKE
YOUR
REMOTE
TERMINALS
GO LIKE
360.**

Products on Show at Spring Joint

HP 2000B Mini Time-Sharing System Costs \$119,000 Bit

PALO ALTO, Calif. — Hewlett Packard is introducing a new mini time-sharing system to the industry at the SJCC.

Called the 2000B, the new system uses a HP 2116B minicomputer as its central processor. The 2116B has a 1.6 μ sec cycle speed and works in 16-bit words in a 16K core memory.

Another HP mini, the 2114B, is used as a communications front end, a 12-Mbit drum provides on-line storage for the smallest configuration of the new system, according to HP.

The system language is Basic. The system sells from \$119,900 with a single teleprinter. This price represents about 30% more than the predecessor system, the 2000A. The company said

2000As can be readily upgraded to 2000Bs in the field.

The 2000B also offers a general business software system and an elementary mathematics instruction package.

HP will also be demonstrating the hardware system for a recently introduced disk operating system, a system designed for small businesses and schools. This system is a combination of the Iomec cartridge disk memory, and an HP 2114B minicomputer.

The minimum system configuration will lease for \$785/mo and will sell for \$36,500. The system, including software, is scheduled for delivery starting this August, the company said.

Other products to be shown

include the HP 2114B mini, an \$8,500 computer with an optional direct memory access high-speed channel; the 2758A tape drive, a 9-track, 800 bit/in., 25 in./sec unit selling for \$9,500; the 7200A plotter that accepts data from time-sharing

teleprinter and produces X-Y plots at \$3,300; the HP 9100 calculator system which includes the 9100B calculator and a group of peripherals (plotter, printer, CRT display, etc.).

A product introduced at the IEEE show, the 2507A coupler/

controller, allows two-directional data transfer in Ascii among up to eight devices. The device is expected to be used in connecting experiments around time-shared terminals.

Hewlett-Packard will be in SJCC booth 2400.

Xynetics 1000 Draws Lines at 40in/sec

CANOCA PARK, Calif. — The 1000 automated drafting system from Xynetics is the center of the company's exhibit at this year's SJCC.

The 1000 draws lines at 40 in./sec with a repeatable accuracy of 0.001 in. and overall accuracy of 0.005 in. The drawing table is 5 ft by 8 ft, and can be expanded in multiples of two feet.

The built-in computer system is an 8K 16-bit word minicomputer. The computer controls scaling, rotation, and local character annotation. A 7- or 9-track tape can be connected as input to the system. The ASR 33 Teletype acts as a system console for input of drawing and control program parameters.

The system includes both a machine-language and a Fortran

IV compiler. The graphic capabilities of these compilers is integral with the drafting hardware

controls.

The 1000 will be displayed in SJCC booth 41000.



The Xynetics 1000 Automated Drafting System

MC 1000 Prints at 65 Char/Sec

ENGLEWOOD, Colo. — The Datalog Division of Litton Systems, Inc. will be introducing its strip and teleprinters at this year's SJCC.

The MC 1000 strip printer prints at 65 char/sec and is loaded by cassette. The unit is non-impact, and noise-free, according to the company.

The MC 3000 military teleprinter operates at speeds up to 3,000 line/min and is also cas-

sette-loaded. A thermal printer, the MC 3000, produces black on white images silently. Data transfer rate is 1 MHz.

Data printers are designed for printing high-speed teletype communications data, telemetry data, monitoring process controls, and general applications which require rapid printouts on-line.

The division will be displaying in SJCC booths 4701-3.

Get big time capabilities. At low down prices. With the most economic access to a large scale computer yet devised, the IDS L-64. It's way out. This remote data concentrator cuts space requirements, cuts the cost factor, cuts the mustard.

IDS grows with your needs instead of your budget. Hook up 16 lines to the L-64. Add on a line at a time all the way up to 64. The line adaptor is built in to give you power to grow on. A four unit ceiling means 256 line potential.

You can keep your distance with IDS. Hook up anywhere in the nation to the EIA RS-232 interface. Local terminals run on VCA; plug-in modem to "data access unit" also available. Wherever you put the L-64, you're going to get new capabilities. Less wasted overhead means more available on-line time.

Speed is the essence of the L-64. Use a mix of different baud rates to feed data to the main frame. From 45 to 9600 bps. Interface with any terminal, including different terminals on the same unit. In larger networks, try multiplexer-to-concentrator or concentrator-to-concentrator.

IDS L-64 is the natural extension of your data processing growth programs. Break the expansion barrier with the remote data concentrator that lets you add a line anywhere you need or want it. When you want it. Bring on IDS.

For more information write or call
KDI Interactive Data Systems
17785 Sky Park Circle, Box AO
Irvine, California 92664, 714-549-3329



Products on Show at Spring Joint

On-Line Terminals Have Local Storage and Processing

CHICAGO — Demonstrations of on-line terminals, data collection systems, inventory control, accounting, and billing will spotlight Victor Comptometer Corp.'s Series 800 line at the

SJCC.

820/03 terminals will be on-line to larger computers in other cities. Equipped with memory and storage capacity, the units also have the flexibility provided

by such peripherals as card, paper tape, or magnetic tape cassette and dual forms feed devices. Each can operate as a free-standing computer.

Terminals combined with the Victor 820/51 communications control unit and 820/56 magnetic tape unit form a versatile data collection system using the full range of peripherals. Up to 16 terminals can be interconnected via direct cable or telephone lines.

Under control of the 820/51, the 820/56 can read and write standard 1/2-in. tape at packing densities of 200, 556, or 800 char/in., 7- or 9-channel.

The 820/25 magnetic ledger card system will show inventory control abilities with two large capacity alphanumeric ledger cards being handled simultaneously. The 820/25 has a capacity of 1,024 digits or 680 alpha char/stripe. Rod cell memory has 2,048 to 16,384 words of 18 bits and core memory of 32 to 1,024 words of 64 bits.

The 820/21 will demonstrate billing with multiple I/O devices up to a combination of nine simultaneously. Available are two paper tape readers, two edge punched card readers, two 80-column card readers, two paper tape punches, two edge



Victor Comptometer Corporation's 820/03 terminal computer.

System Measurement Cuts Costs

PALO ALTO, Calif. — Boole & Babbage will exhibit at the SJCC its Systems Measurement Software (SMS) products for improving system performance. SMS measurement and prediction products provide users with information on their hardware/software configurations that enables them to reduce costs by typically better than 20%, the company said.

Featured at the SJCC will be the problem program evaluator (PPE), configuration utilization evaluator (CUE) and a new product, the data set optimizer (DSO).

The PPE pinpoints high usage areas in a given program, supplying I/O wait time by location or data sets, subroutine and macro-usage as well as other areas that may be improved to decrease run time.

CUE pinpoints systems hardware bottlenecks given any job mix, which permits efficient bal-

ancing of central processing units, channels, control units and other devices to increase throughput. It also helps determine which SVC's to make resident for reducing SVC load time.

The new product, DSO, an extension of the CUE line, is used to troubleshoot specific disk volumes. Using the CUE information, the DSO indicates a better arrangement of data sets for a specific disk volume, showing expected percentage improvement in head movement time, after rearrangement of data sets, according to the company.

SMS products are currently available for IBM/360 and RCA Spectra 70 systems with availability upon special request on other lines at standard product prices.

Boole & Babbage will exhibit in SJCC booth 1512.

punched card punches, two 80-column card punches, and one companion printer.

The 820/10 will demonstrate basic billing/accounting systems. Under program control, the line

extension, discount, and percent of gross profit is computed while the product description is printed directly from memory.

The Victor exhibit will be in SJCC booths 5719-22.

**IT'S
WHAT'S
UP
FRONT
THAT
SYNCS.**

Products on Show at Spring Joint

CMS-7000 Outputs Microfilm at 120,000 Char/Sec

NORTHBRIDGE, Calif. — The CMS-7000 computer output microform system from Computer Micro-Image Systems accepts alphanumeric data on-line or off-line from magnetic devices at data rates up to 300,000 char/sec and prints on any microform at 120,000 char/sec.

Page printing rate is up to 900 page/min. A dual input buffer relieves Fortran and Cobol programmers from record structure restrictions and allows interface with practically any computer device, the company said.

Any character code is acceptable. The CMS-7000 is claimed

to emulate all line printers and other COM systems with no loss in throughput speed.

The CMS-7000 also has features such as: continuously variable reduction ratio 20X to 45X, automatic job setup, precision multiple forms overlay, automatic forms intensity control, 11-in. CRT monitor, business graphics character set for plotting, universal retrieval code module and complete operator file control.

Character generation is stroke. Italics, boldface, lower case and three size changes may be mixed in the same line of print. The

CRT monitor is able to hold data and "see" the form in its microscopic mode to verify hair splitting forms alignment.

A microfiche camera is available to handle tough information publication problems. Up to 32 rows by 32 columns of pages may be recorded on 105mm fiche up to 8 in. long in any

sequential or random order.

No special software is required to produce labels that meet U.S. specifications. The CMS-7000 can meet NMA and Cosati standards for format accuracy, resolution, sequence and use of titles and labels, according to CMIS.

The CMS-7000 will print up to 255 characters per line and 127

lines per page. The system is designed for hands off operation with all variables controllable by the computer including character size, scale factor, record length and many others. Operator errors are eliminated by the use of automatic job setup.

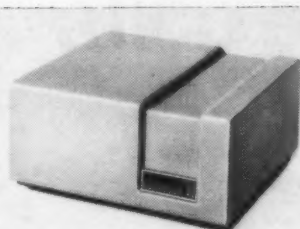
The company is exhibiting in SJCC booths 35004-5.

Astrocom Announces 120 Data Set

ST. PAUL, Minn. — Astrocom Corporation will announce several new additions to its data communications systems line at SJCC.

The Astroset 120 Series, equivalent to the Western Electric 202 data sets; Astroset 701 Series automatic answer adapter for use with the manual DAA; and Astroset 708 Series, replacement for Western Electric 801 automatic calling unit with multi-line capability.

Astrocom's booth number is 49006. The compatibility of this



The Astrocom Corporation is introducing its Model 100 modem. equipment will be demonstrated by on-line computer communications exhibitions.

Modem Does Forward Error Correction

ANN ARBOR, Mich. — Datamax Corp. is demonstrating its 4,800- and 2,400-bit/sec modems for use on voice-grade lines.

The modems with forward-operating error correction are designed to correct errors at the receiver eliminating errors induced by noise on the telephone lines. Errors due to both random and burst-line noise are eliminated.

In addition to forward-operating error correction, the modems include automatic adaptive equalization to compensate for the changing line characteristics which would otherwise induce errors.

Vestigial sideband is used in these modems.

Datamax is exhibiting in SJCC booths 301-2.



Datamax modems are available in either 2,400 baud or 4,800 baud versions.

When interaction between terminals and your operating system slows you down, it's time to tie into our L-64. It's the front end processor that accommodates terminals of un-like baud rates without reduction of data throughput. Take it from your computer. The L-64 lets you drive more data through your CPU. Systematically.

Featuring plug-in adaptors, the L-64 allows you to add a line at a time to your system. When you have 16 lines going for you, add a single line at a time or up to 64 lines at a clip. Up to a whopping 256 line potential.

Keep overhead from clogging your main frame. The L-64 scans all incoming lines. Delivers input to memory from remote terminals or small processors. Using standard baud

rates with four selectable speeds. With high speed adaptors, unload disks, mag tapes, cards, anything from storage into core on high speed lines.

The L-64 keeps your lines busy but requires less than 15% of processor time. That's in full set-up. 64-150 baud lines per unit. All running simultaneously. All in full duplex mode. You get more output, less overflow.

The L-64 can save you up to 40% in overhead time. From 8 to 256 lines, you can't do better than IDS. We'll tell you from the front. Take it from us.

For more information write or call
KDI Interactive Data Systems
17785 Sky Park Circle, Box AO
Irvine, California 92664, 714-549-3329

KDI

Products on Show at Spring Joint

Stored-Program Computer Controls Compat 88-33

WESTBURY, N.Y. — Compat Corp. will display several of its products at the SJCC.

The Compat 88-33 batch data terminal system includes a high-speed line printer (where desired) and multiple input stations. Storage of 256,000 characters is available from four Compat random access magnetic tape magazines. A stored-program computer (up to 16K available) controls operations of the unit providing complete error detection and retransmission capability. Software developed

by the company is also available.

The Compat 88-23/110 data central is a free standing communications controller which receives data from remote terminals and records it on computer-compatible magnetic tape. It will also transmit data from magnetic tape to remote terminals.

The 88-110 performs all communications functions including polling with manual dialing. This is designed to eliminate costly teleprocessing hardware and the need to store and run large

time-consuming communications programs.

The Compat 88-23/110 data central includes a Compat 88-23 processor and an 88-110 tape drive. The 88-23 processor, with 4K by 16-bit memory, performs code translation, data formatting, and data transfer functions. The data is transferred and recorded onto either 7- or 9-track computer compatible magnetic tape reels maintaining full error control including read after write.

Compat 88-23 stored-program batch data terminal featuring

anytime editing, 64,000 character/data storage, error detection and retransmission capability, high-speed transmission, flexible format control.

Compat 88-13 batch data terminal provides 64,000 characters data storage on a Compat random access magnetic tape magazine controlled by hard wire logic. This economical terminal is recommended for situations where the versatility of Compat 88-23 is not required.

Compat 88-03 terminal operates on-line with a standard

electric typewriter keyboard which provides both input and printout capability.

Compat will be on display at SJCC booths 13003-5.

Beta Terminal Can Operate At 30 Char/Sec

BEVERLY, Mass. — The new Beta data communications terminal with switch-selectable baud rate by Syner-Data will be shown for the first time at SJCC.

The terminal system was specifically designed to meet exponentially increasing requirements for low-cost hard-copy terminal devices capable of performing multiple functions with maximum economy.

The company expects Beta will be most frequently utilized as a competitively priced teleprinter communications terminal at speeds up to 30 char/sec. Several features permit it to perform all functions of a business form line printer in applications not demanding high line-printer speeds.

Adjustable column width from 26 to 132 columns permits use with all standard preprinted business forms from 3-5/8 in. mailing labels to 14-7/8 in. inventory and payroll sheets; and impact printing provides up to six clear copies with carbon interleaved forms.

Automatic perforation skip (top of form control) is standard, as is a full 100% duty cycle, the company said.

Use of Beta is enhanced by switch-selectable operating speeds of 10, 15, and 30 char/sec in data communications printer terminal applications.

The latter speed is claimed to be three times as fast as conventional teleprinters and to make maximum use of both existing and future high-speed (300 baud) ports available from many time-sharing companies.

Beta utilizes the standard ASR-33 keyboard layout and provides all 32 Ascii control codes, thus minimizing operator training and providing total compatibility with existing systems and program manuals.

Standard interfaces available include EIA standard RS-232C, computer TTY channel serial, and computer bit parallel broad-side.

Any Beta printer may be modified in the field from an RO configuration to a full KSR or ASR, the company said.

ASR operation is effected by means of Syner-Data's separate free-standing 30 char/sec Model 30 reader/punch, which may be attached to an existing KSR model at any time. A reader/punch is also available. Card reader/punch and tape cassette options will also be announced in the near future.

Prices range from \$3,700 to nearly \$6,000. These units will be displayed in SJCC booths 901-3.

PEC's new 1600cpi and 800cpi tape units work beautifully with the same controller.



Now you can use the same magnetic tape controller for 800cpi and 1600cpi. Without redesigning the controller. And for less cost.

We've taken the formatting electronics out of our transports, included data timing functions which you normally have to provide in your tape controller and packaged the whole works in two new data formatters.

So now with a PEC formatter, your controller can handle 7 and 9-track, 800cpi NRZI and the new 9-track, 1600cpi phase-encoded ASCII and IBM compatible formats. And each of our formatters handle up to four PEC tape transports. So you don't have to pay for formatting each time you buy a tape transport.

The real bonus of course is 1600cpi capability for your system. And we offer that in our new 6600 Series tape transports — ideal for data entry systems, data communications terminals, and mini-

computers. The 6600 Series has all the features such as a read-after-write, dual-stack head, a 9-track phase-encoded IBM compatible recording mode, and tape speeds from 37.5 to 12.5ips with data transfer rates to 60KHz.

And like all PEC models, our 6600 Series has a single capstan drive which minimizes tape skew for increased data reliability and longer tape life. PEC offers the industry's most complete line of low-cost synchronous and incremental digital magnetic tape transports — all IBM compatible — with dozens of models in three reel sizes. All available from our big new plant. And sales and service centers across the U.S. and abroad.

For more information on our 800cpi and 1600cpi tape units, plug-to-plug compatible with the same controller, just write Peripheral Equipment Corporation, 9600 Irondale Avenue, Chatsworth, California 91311. (213) 882-0030

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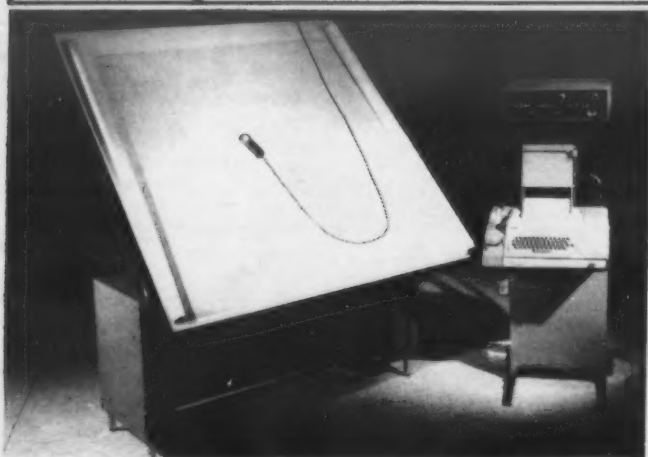
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Products on Show at Spring Joint



The Bendix Datagrid Automatic Drafting System

Electronic Digitizer Cuts Effort

SOUTHFIELD, Mich. — A new, completely electronic digitizer that can free designers and engineers from hours of tedious computational work each year is to be unveiled by the Bendix Corp.'s Advanced Products Division.

Named the Datagrid digitizer automatic drafting system, this unit allows the designer-engineer to digitize information quickly and efficiently into a computer while using conventional drafting procedures and drawings.

Some of the different calcula-

tions that can be made by the system include areas, lengths of straight and curved lines, angles, and intersections.

In addition, three-dimensional calculations, such as volumes and projections, can be made from either two- or three-view drawings.

The Datagrid digitizer features a special all-electronic table area upon which drawings can be placed. This work surface, which is available in sizes of 30 by 36 in., 36 by 48 in., or 42 by 60 in., can be tilted or adjusted for

height as desired. A free-moving cursor, the only moving part in the system, is used to pinpoint coordinate data on the graphic material.

Digitizing is accomplished by selecting a problem from a "menu" of parameters (distance, area, etc.) and relations (line, circle, etc.) attached to the work surface.

Each parameter and relation is contained in a square on the menu, and the operator can choose his problem by positioning the cursor over those squares that are pertinent. Upon recording the appropriate information via a record button on the cursor, the operator is informed what points on the drawing must be digitized. After the operator digitizes the specified points, the computer responds with the answer.

According to Bendix engineers, a major advantage of this automatic drafting system is that no special programming knowledge is required on the part of the operator because he has direct interaction with the computer through the menu. Either a dedicated computer or a time-sharing computer with a teletypewriter or CRT terminal can be used.

The Datagrid digitizer automatic drafting system sells for approximately \$15,000.

Bendix Corp. is a worldwide manufacturer of electronic, automotive, aviation, space, and industrial products, and will exhibit in SJCC booth 50004.



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Magnetic Tape Evaluator Tests At 1,600 Bit/In.

BURLINGTON, Mass. — Computer-Link will be announcing two new products at the SJCC.

A new Model 200 dual-density magnetic tape evaluator equipped to clean and test tapes at 800 bit/in., NRZ or 1,600 bit/in. at the turn of a switch will be shown. This magnetic tape evaluator has eliminated the need for recalibration and adjustment when changing densities, the company said.

It has been specifically designed for those tape libraries undergoing transition to high density tape operation with the need to simply and easily check tapes at both 800 bit/in. and 1,600 bit/in.

Disk Testers

Also on display will be a complete line of disk pack testing equipment for both six high, 1316 style and 11 high, 2316 style disk packs.

These are complete disk pack testing systems for both manufacturer and user testing of all IBM-compatible disk packs. The six high disk pack tester has been designed by the General Services Administration in its recently released specification on six high disk packs.

The company will be in SJCC booths 43008-9.

Products on Show at Spring Joint

Tape Batch Terminal Can Store 280,000 Char/Reel

KENT, Washington — Tally Corp. will highlight the 1021 data terminal that features keyboard-to-tape data entry and high speed data transmission capability at this year's SJCC.

This batch terminal is suited for multiple branch office locations with high data volumes that report on a regular basis to a central computing facility.

Data storage capacity is 280,000 char/reel, with 140,000 characters available on each of two data channels.

The terminal operates with a Bell 202C-2 data phone or equivalent modem that transmits or receives at 1200 baud. During transmission, the terminal performs error detection and correction routines by checking each character for proper parity at the receiving terminal. Unattended answering is an added standard feature.

Compatible

The terminal is compatible with all other Tally transmitters and receivers, whether paper tape or one-half inch computer compatible magnetic tape.

The terminal with wide carriage typewriter and data phone adapter rents for \$395 a month, including service.

The computer-compatible System 4031 magnetic tape terminal provides point-to-point data communications at speeds of 1200 word/min serially or 600/720 word/min in a parallel format over ordinary telephone lines.

The 4031 is completely compatible with all other Tally send and receive terminals in any given transmission network. Recording densities of 200, 556, or 800 char/in. in 7-track or 300 char/in. in 9-track format are offered.

Features include automatic er-

ror detection and retransmission and unattended answering capability. Hardware code translation is provided in the 4031 to convert between BCD paper tape, BCD magnetic tape, or nine-track Ebcidic codes, depending on the code requirements of the remote terminal. Other code translations are available on special order.

The 1021 and the 4031 will be on display in SJCC booths 107A, B, C.



ATC 2000 Terminal

ATC 2000 Displays 1,920 Characters at 2,400 Baud

SOMERS POINT, N.J. — The Atlantic Technology Corp. 2000 data display terminal, which will highlight this firm's SJCC exhibit, offers users a 1,920-character display capability and IBM 360 compatibility, the company said.

Remote stand-alone units can offer either 960- or 1,920-character screens, and can operate asynchronously at speeds up to 2,400 baud. Multistation systems can be run directly, or

brought in over communications lines. Local systems can run at speeds up to 2,560 byte/sec, the company stated.

Large-scale communications users, such as the federal government, utilities, and time-sharing firms, have used the ATC 2000 for message editing, message assembly, and general text manipulation, according to the company.

The ATC 2000 will be displayed in SJCC booths 104-5.



Join the great tape escape!

With TAPE-MARC*. The revolutionary, new magnetic tape leasing system that offers you four freedoms:

Freedom from tied-up capital. We'll pay you immediate cash for your entire tape library — but you keep the tape!

Freedom of choice. We'll replace 25% of your library each year with fresh, new tape — any type, any brand you choose!

Freedom from costly reruns. This programmed replacement plan will eliminate worn and error-producing tapes!

Freedom from cost fluctuation. One fixed monthly rate lets you manage a smooth, predictable budget year after year!

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Tally 4031 Magnetic Tape Unit

Singer announces a magnetic data recording system that lets you plug in extra capacity. As much as you need. And whenever you need it.

Introducing the Friden* 4300 magnetic data encoding system. It lets you start small without shortchanging your company's future. Because it lets you plug in extra capacity. As much as you need. Whenever you need it.

Your 4300 system can start with a single Friden 4301 Magnetic Data Recorder. It's a complete table top data entry system by itself. Keyboard. English language alphanumeric display. Two control programs. Magnetic tape deck producing computer-compatible high-density tape (with choice of 200, 556, or 800 bpi densities in 7-track, 800 in 9-track).

And a dial-selected pooling mode. So your free-standing 4301 can become the central pooler for other 4301s or up to eight inexpensive 4302 keyboards. Just plug them into your 4301 and go to work.

And that 4301 remains in your system as you grow to full network configuration with additional keyboards and either 16- or 64-capacity magnetic data central poolers.

You never need a costly multiplexer/controller in your 4300 system. Because your 4301s already contain the logical control, data record segregation, and central recording

backup functions. And that adds up to greater cost-performance efficiency at every size and configuration of 4300 Magnetic Data System.

But that's not all. The Friden 4300 Magnetic Data System simplifies virtually every operational sequence for ease of training and operation. The 4300 associates normal function keys with corresponding program entries, making manual program entry extremely easy. Verification includes keyboard check, read-after-write check, vertical parity check, longitudinal and cyclical redundancy checks, with both visual and audible warnings and keyboard interlock.

And the Friden 4300 units themselves are quiet, compact and attractive. Your 4300 can be in one room. Or stretched across the nation with the addition of telephone communications links.

So your Friden 4300 Magnetic Data Recording System grows as you grow. And you can lease it for a year. Or better still, enjoy savings on two- or three-year leases. It's the industry's most attractive lease plan—an innovation in itself.

For complete information, call your nearest Friden office. Or write: Friden Division, The Singer Company, San Leandro, Calif. 94577.

**4302
Magnetic Data
Keyboard**

A keyboard-only data entry station, pools with 4301, 4303, or 4304 Poolers.

**4303
Magnetic Data
Central Pooler**

Pools and records for up to 16 4301 Recorders or 4302 Keyboards in any combination. 7- or 9-channel models.

**4304
Magnetic Data
Central Pooler**

A pooling and recording center for up to 64 work stations in any combination. 7- or 9-channel.

**4301
Magnetic Data
Tape Recorder**

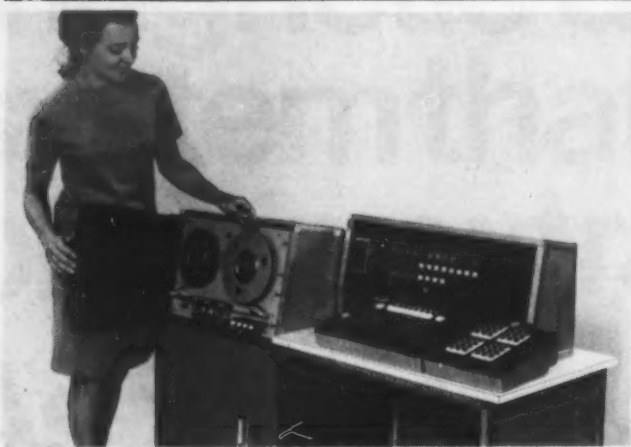
A complete, computer-compatible data-entry system. Also serves as pooler for other 4301s or up to 8 inexpensive 4302 Keyboards.



Another people-oriented business system from Singer

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Products on Show at Spring Joint



Keymatic 1093 Data Encoder

K-100 Encoder Goes Key-to-Tape

BAY SHORE, N.Y. — Keymatic Data Systems Corp., a specialist in data entry, will be exhibiting two new products at the SJCC.

The K-100 encoder is a keyboard to cassette data entry station, and the K-200 is a polling converter to convert the cassettes from the K-100 to computer-compatible 7- or 9-track tape.

In addition to its new products, the company will exhibit the Keymatic Series 1000, a solid state, keyboard to magnetic tape off-line computer en-

try device. Its uniqueness lies in the fact that it was not designed to be an "electronic replacement for the keypunch."

The 1000 encoder records both upper and lower case characters, with typewriter simplicity, onto standard 1/2 in. computer-compatible magnetic tape: 7-track at 556 bit/in. or 9-track at 800 bit/in.

Physical record lengths which the Keymatic encodes on magnetic tape can be both virtually infinite if required, and completely variable between con-

secutive records, the company said.

The Keymatic has an enlarged character set which permits any of the 256 Ebcidic codes to be encoded on the magnetic tape from just a single key depression. This 256-character set permits a macro-keyboarding operation.

Any one of the 256 Ebcidic codes may be used as field identifiers, or to represent common recurring data or text in the job, according to the company.

Many keystrokes can be saved by keyboarding the repetitive data with a single keystroke, and upon read-in to the computer, letting the computer expand or "explode" single codes into constants stored in the computer. These constants may be of any length and represent the most frequently reoccurring full words, or combination of characters, just as if the operator laboriously had keyed in every character.

Keymatic is suitable for jobs that have a high degree of alpha content and for jobs which have long, variable length fields and records. It simplifies many jobs where data is keyboarded in a random fashion, or where fields within a record are randomly omitted, the company said.

New Products

The K-100 is a solid state keyboard-to-cassette computer entry device. The Series K-100 will consist of three models: Model K-101 with a master typewriter keyboard only will record 102 codes in Ebcidic serially on a magnetic tape cassette; K-102 will consist of a master typewriter keyboard and function control panel and will record 162 codes on tape; and K-103 will consist of a master keyboard, function control panel and auxiliary keyboard and will record all 356 Ebcidic codes all with a single key depression.

The Series K-100 is designed for jobs requiring upper and lower case characters, and variable record lengths. The enlarged 256-character set permits a macro-keyboarding operation.

The K-100 will sell for \$6,500 to \$7,500 and rent for \$169 to \$251.50 per month on a minimum 24-month plan.

First deliveries are scheduled for October, 1970.

The K-200 pooler/converter will convert from the cassettes recorded on the K-100 encoders to standard 1/2 in. computer-compatible 7- and 9-track magnetic tape.

There will be two basic models of the K-200: K-290 will convert, and the K-200 is a pooling unit that converts the cassettes from the K-100 to computer-compatible 7- or 9-track tape. Multiple cassettes can also be pooled onto the same master reel of standard computer magnetic tape. Price will be about \$15,000 and first delivery is scheduled for October, 1970.

Keymatic will display in SJCC booths 47005-6.

\$25,000 disc storage drive sells for \$15,000.

We mean it, and we can prove it.

Our new Bryant 1100 Disc Storage Drive (which sells for about \$15,000 and leases for \$460) is equal in every way to IBM's 2311 (which sells for about \$25,000 and leases for \$570).

The 1100 has the same 7.25 million byte capacity. Same access

time. Same function, style and interface. In other words, the Bryant 1100 is instantly compatible with IBM 360 computers using the 1316 written disc pack.

And we didn't forget about service. We regularly schedule maintenance on a three-month cycle. Or as quick as you need it. On a nationwide

basis.

In our estimation, this makes the 1100 just a little bit better than the 2311. So, why pay \$10,000 more for a set of initials? If you can think of a reason—even a little one—drop us a line. Bryant Computer Products, 850 Ladd Rd., Walled Lake, Mich. 48088.



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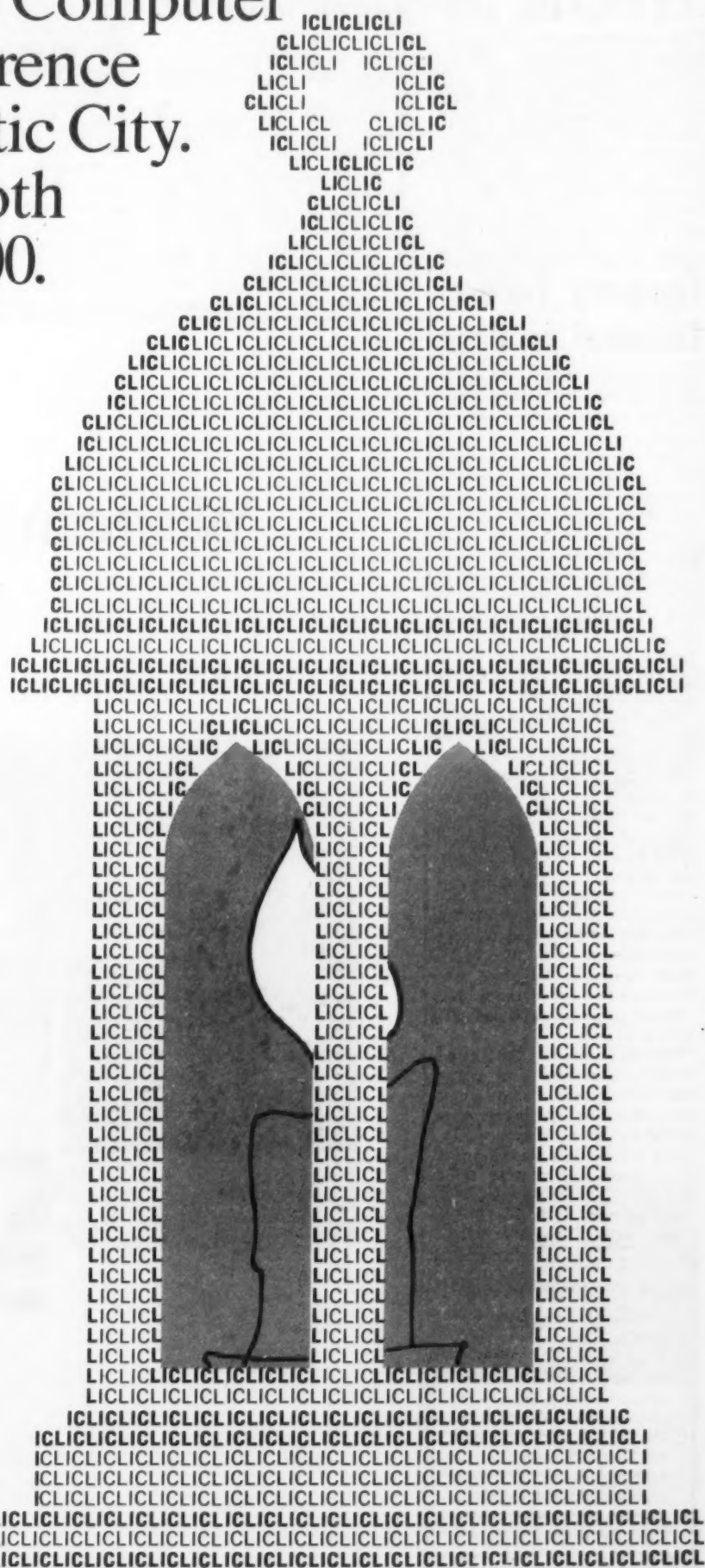
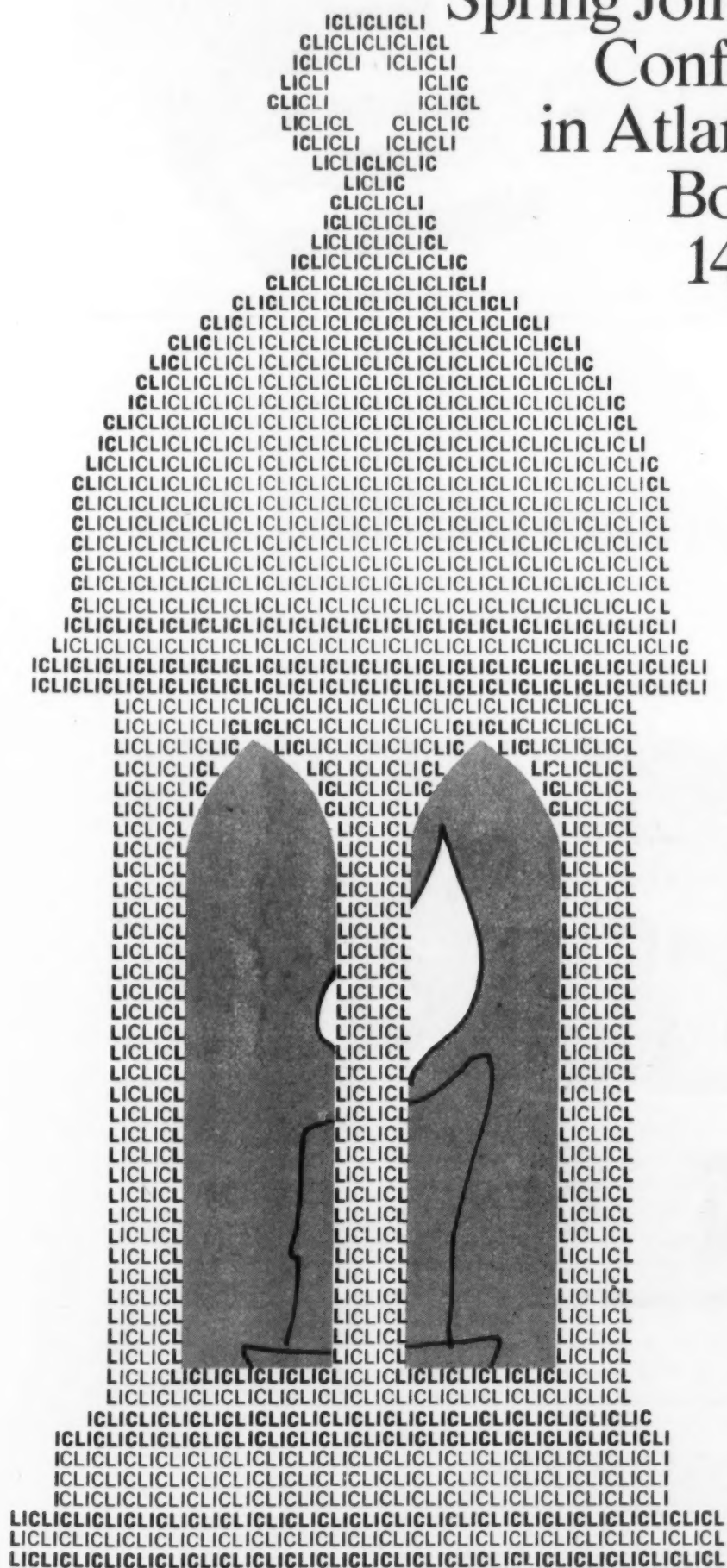


EX-CELL-O CORPORATION

Since we've been unable to locate Mr. Revere,
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the extent and sophistication of our peripherals. And to let you chaps know that we speak your language, remember:
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Products on Show at Spring Joint

CRT Displays 1,800 Characters

CRANBURY, N.J. — A new video terminal, Model DW-33, from Alphacom, Inc. (formerly Alphameric Data Corp.) will be displayed at the 1970 SJCC.

The low-cost DW-33 is designed for time-sharing and as an I/O unit for small computers. Selling for under \$3,000 it offers several features unavailable with other low-priced display units, such as 25 lines of 72 characters each (80 characters optional); and character insertion and deletion

with capability to spread or close up a line of characters, the company said.

Other features include:

- Rapid file access and editing flexibility.
- Complete functional and software compatibility with teletype-oriented systems.
- Five operating modes — compose, conversational, and batch, with optional format and print modes.
- Solid state logic and keyboard unit.
- Display unit readily service-

able by local television repairmen.

• Automatic line-by-line roll-down in conversational mode.

• Sixty-four character repertoire (same as TTY 33 with vertical and left arrow).

The DW-33 consists of a television-type display unit and a keyboard-logic unit. Both are physically separate for flexibility, portability and operator ease of operation. Delivery is 30 days. Price is under \$3,000 in quantity.

The DW-33 can be seen at booth 51003 at the SJCC.



DW-33 Video Terminal

Company Tailors Terminal to User

MAYNARD, Mass. — Data Terminal Systems is showing a new concept in data capture and retrieval.

Users requiring data capture and retrieval may now purchase a terminal which is custom configured to their exact requirements. This enables the EDP system to be extended into data creation. It allows the user to design his own terminal to be used by personnel using familiar notations in the natural sequence of data entry. Only those options necessary to perform the job need be purchased.

Users have a variety of terminal options to choose from including: variation in number of keys, size, color, grouping and key top designation; printers (6, 20 and 80 column); displays (message units and numeric); credit card/badge readers; tape cassette; and cash drawer.

The terminal may include stand-alone logic and processing capability or be linked up to a minicomputer with up to 32 other terminals. Software may be selected to the level required.

Prices for the DTS terminal start at \$1,500.

Potential uses for the system include: job shop data collection, billing and charges collection, inventory status reporting, credit and point of sale applications, patient data price information recall, payroll-time clock, etc.

The terminal system will be on display at SJCC booth 36001.

Western Airlines goes first class



CUT COMPUTER COSTS IBM MODEL 25, 30, 40, 50 USERS

It is no longer necessary to struggle alone in EDP. You can now share a computer with other compatible users in your area. We will form this group for you, establish the Shared Service Center®, and then provide continuing management of the Center. The result—a lower cost to you. Unlike timesharing, this approach is intended for commercial applications. For further information write: President, The Silber System Inc., 430 East 56th Street, New York, New York 10022.

THE SILBER SYSTEM INC.

Products on Show at Spring Joint



International Data Science Model 2000 Programmable Digital Printer

Libra 1 Key-to-Tape Pools, Counts Records, Displays

PROVIDENCE, R.I. — A stand-alone key-to-tape data station with features designed for more efficient operation is to be introduced at the SJCC by International Data Sciences, Inc.

The Libra 1 incorporates all the advantages of a modern key-to-tape but also includes special features that are desired by operators and professionals in the data entry business, according to company President Renato D'Antonio.

Libra 1 offers read after write checks, selective non-verification, and an English-oriented display that requires no more space than a standard keypunch, according to the firm.

Options include a record counter, zero balance fields, self-check digits in Luhn, modulus 7, 10, and 11, auto pooler, and listing accumulator.

The company is also introducing its Model 2000 programmable digital printer. The printer is most suitable for on-line testing records and other applications where long periods of unattended recording must be made,

with CRT display from Conrac.

IT IS EASY TO SEE WHY.



A million dollar public information system has to look like one. That's the kind of thinking which put Conrac aboard Western at Los Angeles International. Their multi-channel system is computerized to keep track of several important activities, including arrivals, departures and baggage disposition. Within the system are eighty Conrac displays. You can find them almost anywhere. At boarding sites. On the ramps. Behind counters. Near claim areas. In the dispatcher's office and crew lounges. Displayed information is always steady, always sharp and clear.

There is a good reason why. Conrac supplies more high performance video equipment for industrial use than any other manufacturer. We make both color and black and white displays in most sizes for single and multi-party viewing devices. We make complete input/output terminals for OEM's. We make video sections for data display terminals. And our monitors are the world standard for both black and white and color television. If you are in the CRT display market, call us. Your customers will thank you.

CONRAC
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600 North Rimsdale, Covina, California 91722.
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Libra 1 Data Entry System

the company said. The printer codes the output to indicate what caused the particular recording.

International Data Sciences, Inc. will be in SJCC booths 43001-2.

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Delta's Responsibility Accounting System for banks will give you an instant program on which to build a viable, comprehensive profit plan. The system provides for a 5-year projection of income and expenses with a detailed monthly projection the first year and comparative monthly reports thereafter to report deviations between performance and projections. Other bank packages include: General Ledger, Credit Card, Installment Loans, Plan for a profit. Contact:

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MODEL 6101 SPECIFICATIONS

Record Length: Variable, up to 80 characters
Maximum Line Length: Unlimited
Reading Speed: 80 character positions per second
Document Size: Standard 1-inch paper tape rolls up to 200 feet
No. of Line Positions: 1
Feed Method: Automatic
Forms Handling: Manual (Automatic-optional)
Power Requirements: 110 VAC, 60 Hz, 2 amps
Ambient Temperature Range: 32°F to 96°F
Maximum Relative Humidity: 98%

\$7200

MODEL 6103 SPECIFICATIONS

Record Length: Variable, up to 80 characters
Maximum Line Length: 9.625 inches (90 character positions)
Reading Speed: 80 character positions per second
Document Size:

	Length	Height
Min.	2.329 inches	3.250 inches
Max.	9.625 inches	3.250 inches

Read Area: 2 inch band starting .5 inches from the aligning edge of the document
Data Position: .25 inch data path located anywhere within the read area
Feed Hopper Capacity: 250 documents
Stacker Capacity: 250 documents
Feed Method: Automatic
Forms Handling: Automatic
Paper Stock: 80# to 125#
Power Requirements: 110 VAC, 60 Hz, 2 amps
Ambient Temperature Range: 32°F to 96°F
Maximum Relative Humidity: 90%

VIATRON Computer Systems Corporation
Dept. C-20
Route 62
Bedford, Massachusetts 01730

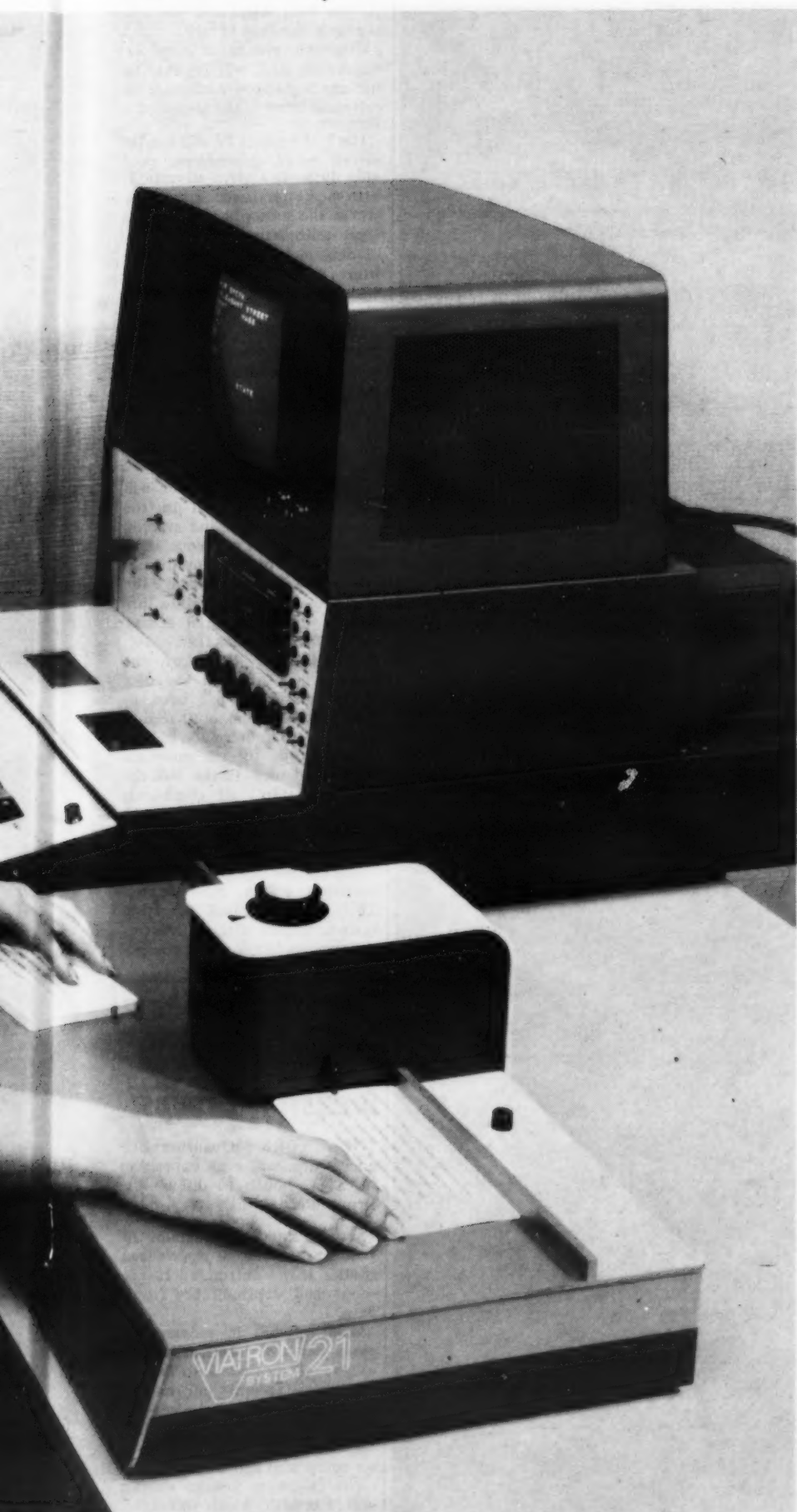
Please have a VIATRON dealer contact me immediately with the full story on your new Optical Character Readers.

Name _____
Position _____
Company _____
Address _____
Telephone Number _____



READ ME ?

VIATRON OPTICAL CHARACTER READERS



\$4800

MODEL 6102 SPECIFICATIONS

Record Length:	Variable, up to 80 characters
Maximum Line Length:	11 inches (100 character positions)
Reading Speed:	80 character positions per second
	<i>Length Height</i>
Document Size:	Min. 3 inches 2.125 inches
	Max. 11 inches 11 inches
	(One inch paper tape optional)
Read Area:	2 inch band starting .5 inches from the aligning edge of the document
Data Position:	.25 inch data path located anywhere within the read area
Feed Method:	Automatic
Forms Handling:	Manual
Paper Stock:	10# to 125#
Power Requirements:	110 VAC, 60 Hz, 2 amps
Ambient Temperature Range:	32°F to 96°F
Maximum Relative Humidity:	98%

VIAFONT

ABCDEFGHIJKLMNOPQRSTUVWXYZ
_1234567890 \$%&'()*+,-./:;<=>?@

This is VIAFONT-X, the first graphic form of VIATRON's radically low cost, proprietary optical character detection scheme. VIAFONT is a unique, man/machine readable code which includes all the standard alphanumeric and punctuation characters. It also provides special characters, featuring an over-print character for correcting typing errors, and a character which allows a typist to bracket any data not to be read as input.

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VIATRON

SYSTEM 21

THE STANDARD OF THE 70'S

Products on Show at Spring Joint

Data General Adds Algol, Fortran IV, DOS to Nova

SOUTHBORO, Mass. — Data General Corp. will announce a new package of software at the SJCC.

Taken together, the new software, including a complete Algol 60, two varieties of Fortran IV, and a device-independent disk operating system, represents the

single largest package ever to be introduced at one time by a minicomputer manufacturer.

According to Henry Burkhardt III, company vice-president, the new software will give the Nova and Supernova minicomputer systems versatile high-order language capabilities.

The Algol compiler for its Nova and Supernova will be a full implementation of Algol 60. The Nova/Supernova will generate optimized assembly language code. Extensions will provide for the manipulation of character strings.

The Data General Algol, when

introduced, will provide for precision arithmetic, allowing the user to achieve 20-25 digits of precision, the company said.

According to Burkhardt, the Algol 60 software is aimed at the minicomputer systems developers and other sophisticated users who do not wish to solve problems in an assembly language.

As a higher-order programming language, Algol has traditionally been popular in Europe, where it was first developed.

Two types of Fortran IV are also to be introduced at the SJCC by Data General. The first of these will be a full Ansi Fortran IV which will produce assembly language output compatible with Algol and will use the same run-time library.

With this system, a Nova or Supernova user will be able to use one higher-order language to call up another in the course of a program.

The full Fortran IV will handle mixed mode expressions; provide dynamic storage allocation; allow generalized subscripts, where the subscript may be any legal arithmetic expression including a function call or another subscripted variable; and will handle variable names with any number of characters.

The other Fortran IV will be Ansi Basic Fortran IV, which will provide a high-speed, single-pass system which generates interpretive object code in those applications where more complex capabilities are not required.

The disk operating system will be device-independent. In the Nova or Supernova disk system, the program will reference a file which can represent any device.

Also to be featured will be a file structure which will allow unlimited length, random access, and sequential access files.

According to Burkhardt, the basic concept behind the disk operating system has been to construct a system both readily usable by the novice and sufficiently flexible for the more sophisticated user. In the disk operating system, all commands will be files, allowing the sophisticated user to add commands virtually at will.

Among the features of Data General's booth 2600 at the SJCC will be a disk operating system running with an interactive graphics terminal and compiling Algol.

Quantum to Show Analysis of DP Industry Groups

NEW YORK — Quantum Science Corp. will have experts in its SJCC booth to discuss the firm's industry analyses.

Several standard programs of analysis as well as specialized studies have contributed to the scope and depth of the firm's data.

Major studies in progress include network information services, dedicated information systems, federal information systems, a study of the computer memory markets, and Maptek strategy programs in computer equipment and services.

The Quantum Science exhibit will be in SJCC booth 50009.

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Right now we're gearing up for the "Seventies" and the new generation of tomorrow's computer techniques. EMR Computer means business and knows business. Computer business, that is!

Built by people and fortified by performance, our hundreds of worldwide installations are certainly endorsing the role EMR Computer plays in the world's fastest growing industry. Today and tomorrow we are continually ex-

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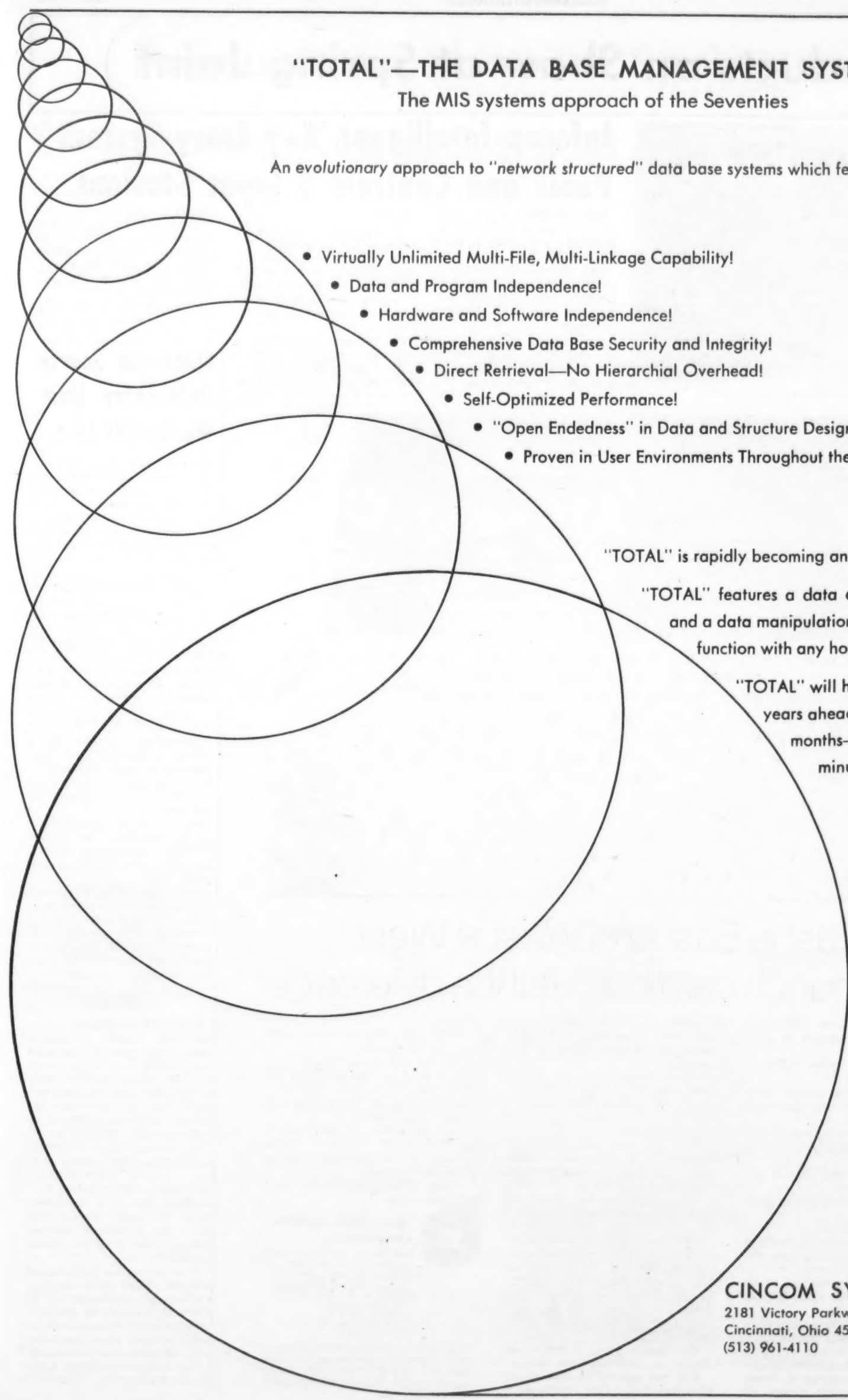
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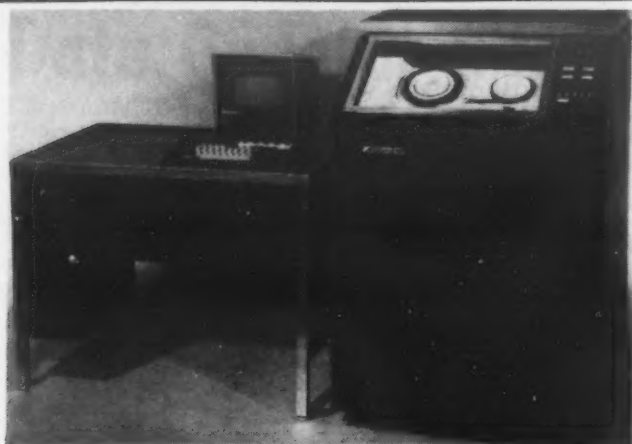
"TOTAL" features a data definition language and a data manipulation language which function with any host language.

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Products on Show at Spring Joint



Inforex Intelligent Key Entry System.

Inforex Intelligent Key Entry System Pools and Controls 8 Input Stations

BURLINGTON, Mass. — Inforex is planning to display its Intelligent key entry system at the show this year.

With the system, the data is pooled into an intermediate memory, and then spooled onto tape. The tape can be either 7- or 9-track.

The control unit will handle up to eight Keystations, and includes its own disk memory, tape drive, control and logic circuitry, and central communi-

cations.

The Keystations are desk-oriented, with built-in displays.

Up to 256 independent programs can be stored in the disk memory, permitting rapid switching between different applications, according to the company.

The system is geared to compete with stand-alone systems with six or more stations. Prices for equipment are: \$560/mo for the control unit and \$25,000 for

purchase; Keystations cost \$50/mo and sell for \$1,200. Maintenance charges run \$50/mo for the control unit and \$4/mo for each Keystation. Maintenance charges only apply to purchased systems.

Inforex will display its Intelligent key entry system at SJCC booth 5300.

Madatron Source Data Entry Unit Works Off-Line

WHIPPANY, N.J. — A new source data collection device designed to satisfy the growing need for an economical and easy-to-operate unit for collecting and originating computer input data will be exhibited for the first time at the SJCC by Madatron Corp.

The new source data collection device allows employees unskilled in operating DP equipment to enter data directly at the source where it is generated, in real-time. Data is entered in human language through alphanumeric display. Extensive coding formats are not required.

Off-Line, On-Line

This device can serve as an off-line peripheral data computer input source, or many of them tied together can be put directly on-line with a computer system.

The Madatron alphanumeric display may show any type of character, numeral or symbol, and uses a miniature single-gun 3/4-in. CRT.

Single-plane display allows easy viewing and recognition up to an angle of 160 degrees. Variable brightness is also provided. The display is self-contained and requires only 115 Vac and a six-line entry code.

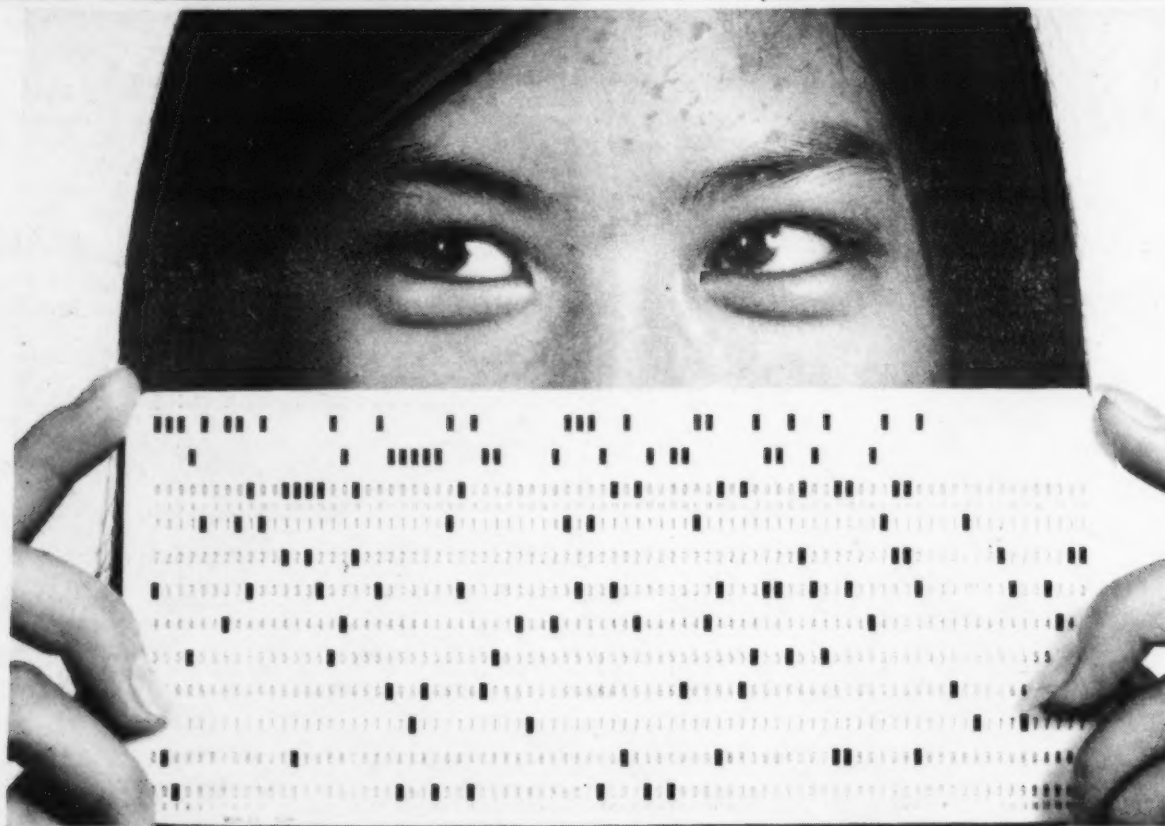
25,000 Hours

Each CRT is designed for a minimum 25,000 operational hours. The character generator can produce 48 or 64 characters per CRT, and an unlimited number of CRTs can be arranged in a wide variety of modes and different panel configurations to meet customer specifications.

The annunciator, or complete word display unit, handles up to 128 10-letter words (instructions, commands, warnings, etc.) displayed in a 10- or 20-position array. The words are obtained from the permanent memory storage device developed by the company.

These words are programmed into the storage device and may be selected individually by an operator, activated by machine, or triggered by transducer monitored systems, alarm signals, or internal automatic sequencing.

The company will be in SJCC booth 49002.



East is East and West is West and a punch card can't tell the difference.

Once upon a time, Latin was the universal language of educated men.

But now the whole world speaks keypunch.

That's how come we can save you 50% and more on your next keypunching job.

Because we keypunch in the British crown colony of Hong Kong.

10-day turnaround, 99.8% accuracy guaranteed.

And half the price you're paying now.

How can we do it?

Well, in Hong Kong, being a keypunch operator is a very desirable, highly-paid job.

(Maybe it has something to do with our traditions. After all, we invented computers.)

Whatever the reason, our girls come from the top educational level of the job market. We only hire 4 out of every hundred applicants! Since everyone in Hong Kong speaks English as well as

Chinese . . . all our girls do, too. And they all go through the standard IBM keypunch training program.

We've provided them with 029's and 059's to produce more than 100 million keystrokes a month, in a modern, air-conditioned building.

We pick up your keypunch job today and hand-deliver it onto one of our daily air freight flights direct to Hong Kong.

Our people on the other end pick it up and turn the material over to our smart Chinese girls.

Ten days later you get it back, on genuine IBM cards. The accuracy is 99.8% or better, and we guarantee it. The price is half, or less, what you'd pay in the United States. And you can get your output on magnetic tape at no extra charge.

On larger jobs, it takes us longer . . . just like anyone else.

But the quality is the same, whether it's 5,000 cards or a

million.

We're not asking for your largest job right away.

Try us out on a smaller one. Call one of our offices listed below. (We may refer you to a closer office; we're opening new ones every month.)

Let us prove to you that a punch card doesn't know whether it was punched in Hong Kong or Hartford.

Only your comptroller will know for sure.



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China Data Systems Corporation is actively seeking representation in every major U.S. city. Interested individuals or service bureaus may contact any of the above offices.

Products on Show at Spring Joint

CP-4 Terminal Communicates at 240,000 Bit/Sec

SANTA ANA, Calif. — Data Computer Systems (DCS) has announced 60-day delivery of all models in the company's line of remote batch processing terminals.

The IBM-compatible System CP-4 remote communication terminal handles all standard transmission codes (Ascii, Ascii-8 and Ebcidic) at transfer rates up to 240,000 bit/sec.

The company is also introducing matched line printers and card readers. The new models are: CP-4 Model I-D and CP-4 Model I-C, which match the 300 card/min reader and 300 lin/min printer; CP-4 Model IV, which matches a 600 card/min reader and 600 line/min printer; and the CP-4 Model V, which has a 1000 card/min reader and 1000 line/min printer. The addition of these new models to the line brings the total models of System CP-4 to eight.

Purchase prices for System CP-4 start at \$29,000. System

CP-4 is also available on a one-year and three-year rental plan.

The equipment uses integrated circuits and MOS memory systems. The use of the large functional-board concept, production techniques and method of checkout assures system reliability.

System CP-4 is directly compatible with IBM 360 systems and is presently working with 360 software such as RJE, Hasp, and Btam. It has also been fully checked out with other 360 communications software.

System CP-4, because of its capability to handle Ebcidic

(eight bits), Ascii (seven bits and parity), and Ascii-8 (eight bits and parity), is also compatible with most other computers manufactured.

Other System CP-4 features are: data compression, record counter display, select number of records (1-12), full- or half-

duplex, automatic answering, horizontal tab for printer, additional memory up to 3200 characters, internal speed of 240,000 bit/sec, data scrambling, capability to tie-in up to 30 I/O devices, and error control.

DCS will exhibit in SJCC booths 45010-13.

Tektronix 4901 Is a Universal Graphics Terminal

BEAVERTON, Oregon — The Tektronix 4901 interactive graphic unit acts as a universal electronic interface between the company's T4002 graphic computer terminal and Tektronix-developed graphic input devices.

The 4901 is designed for use wherever graphic analysis of statistical data is fundamental to thorough scientific investigation, effective computer-aided instruction and sound decision making.



Tektronix 4901 Display Terminal

The 4901 and optional joystick are software supported. The software permits coordinate identification, display rotation and overlaying, menu picking and other frequently repeated functions in graphic formatting, the company said.

The unit generates a bright, no parallax, orthogonal-crosshair cursor which is positioned with the desk-top joystick.

Data points and instructions are entered through the T4002 keyboard.

The display device of the T4002 is a flicker-free storage CRT that retains displays without costly refresh hardware, the company said.

Prices start at \$8,800. Tektronix products will be on display in SJCC booth 4900.

how to distribute 650 lb of computer information in a number 10 envelope

It doesn't take long to accumulate 100,000 pages of computer output. But with impact printing, what do you have? 650 pounds of paper on your hands. Difficult to decollate, burst and bind. Impossible to lift by hand, expensive to mail and store. Unsuitable for the urgencies of modern decision making.

With Datagraphix Micromation, you can hold the equivalent of 18,000 computer pages in the palm of your hand. Any page can be accessed within seconds from the display screen of an inquiry station. Providing hard copies on demand. High volume production printing from film on preprinted forms at 5,200 pages per hour. Or you can reduce a 1000 pounds of paper printout to a few ounces and mail it over long distances overnight at less than 50 cents.

Micromation is more than a 30,000 line-per-minute computer printer. It's the best communicator

a computer can have. Moving needed information to its multiple destinations to improve business. Keeping fact files fresher up, down, and across your organization. Disseminating computer generated reports more immediately to your customers, stockholders, or others inside or outside the company.

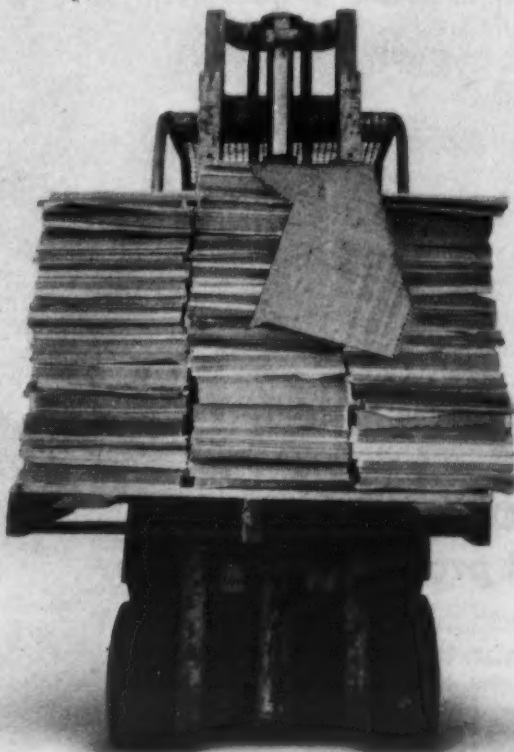
Compared to impact printing, Micromation is 27 times faster, takes 1/18th the computer time, slashes the cost of paper/carbon consumables 87%, and reduces 99% of your storage requirements.

Only one company offers the complete family of machine systems; service centers; Kalvar dry film processing; all associated supplies; systems and software support; worldwide maintenance. Discover what Micromation can do for you.

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Datagraphix
micromation systems



The incredible reducing machine.

Reduces personnel turnover

KEY-EDIT provides a far more pleasant working environment. This easy-to-learn system is virtually noiseless. Data handling is minimal.

Reduces need for verification

The powerful edit routines can verify your data as it is keyed into the system, thereby reducing the cost of duplicate keying for verification.

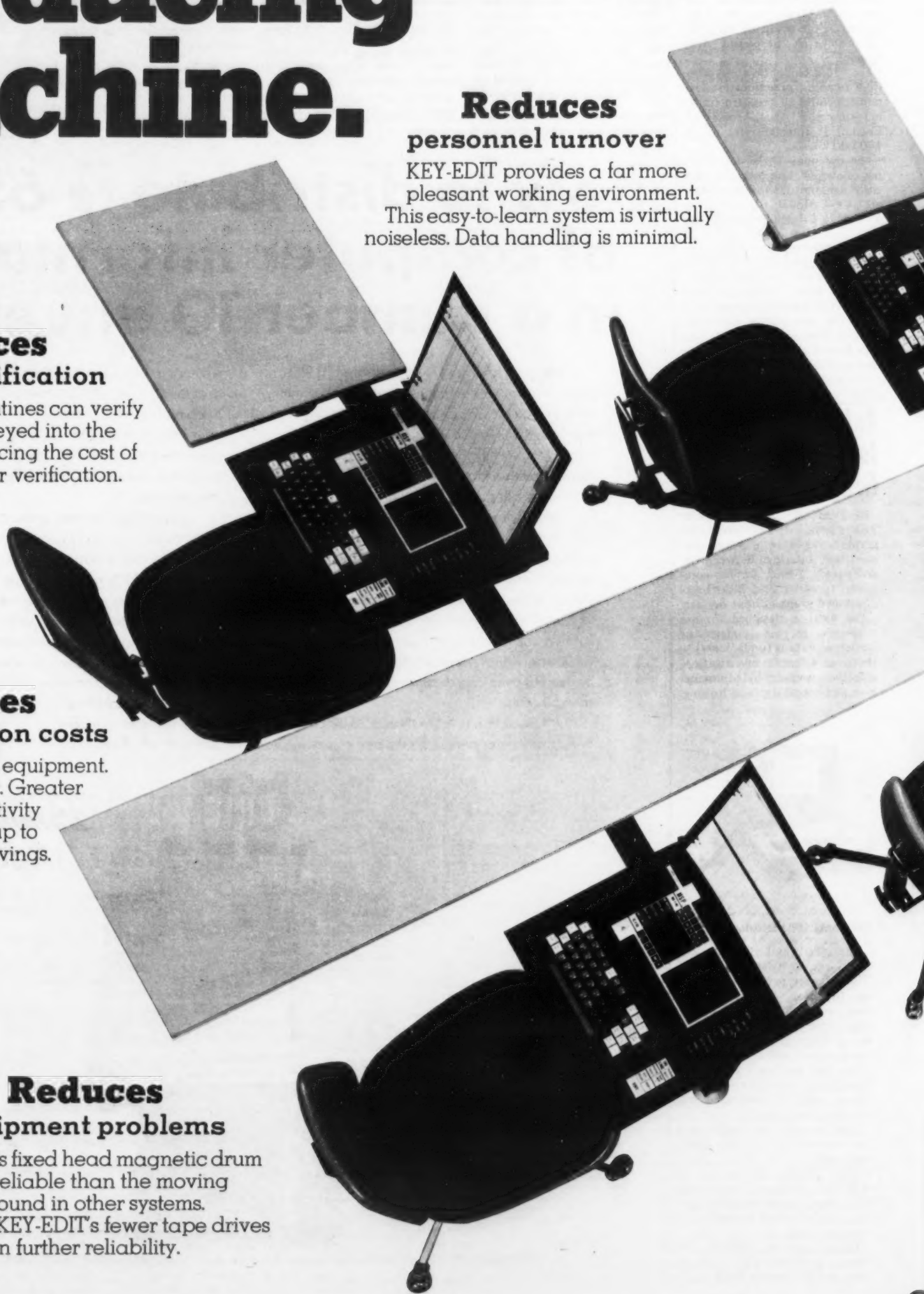
Reduces data preparation costs

Fewer operators. Less equipment. Improved accuracy. Greater flexibility and productivity all add up to significant savings.

Reduces equipment problems

KEY-EDIT's fixed head magnetic drum is more reliable than the moving head disk found in other systems.

And KEY-EDIT's fewer tape drives ensure even further reliability.



Reduces job turn-around time

You don't have to wait for your big computer to find source document errors. Checking and editing routines dramatically speed-up work cycle.

Reduces required floor space

KEY-EDIT actually saves up to 50% in floorspace over keypunch and key-to-tape units because of compact key stations.



Reduces elapsed time and scheduling problems

Data that requires verification can be verified by one operator while it is being encoded by another operator — cuts job time in half.

KEY-EDIT

the first multi-keyboard
data preparation system

KEY-EDIT reduces data preparation problems to an absolute minimum

Reliability is the only thing not reduced by "The Incredible Reducing Machine." KEY-EDIT works. KEY-EDIT is installed and operating at major data processing installations *now*.

Its reliability is ensured by reliable delivery and reliable service and reliable people.

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Reliable Service. It's one thing to install a system. Another to ensure that it works and keeps on working. KEY-EDIT works and continues to work because it is backed by

Reliable People. Marketing people. Technical people. Systems engineers and designers. Both from North America and Europe and *in* North America and Europe. Find out for yourself. Call or write now. Right now.



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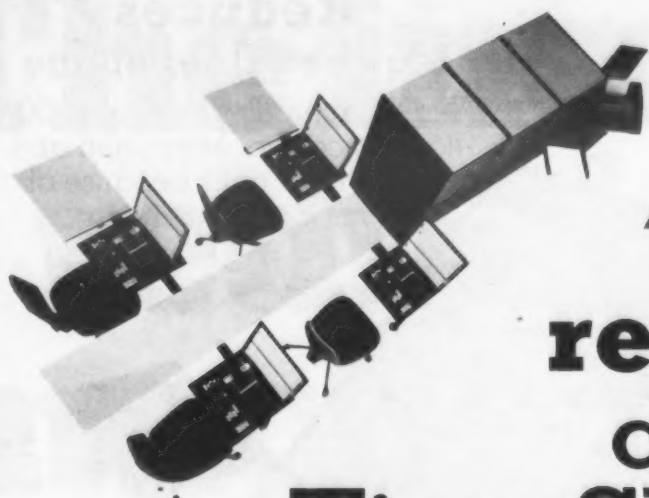
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Products on Show at Spring Joint

Bell System Lets Viewers Talk to Data Experts - Live

NEW YORK — Data communications specialists attending the SJCC will be offered the opportunity to speak with major pioneers and leading experts in the data field.

The Bell System exhibit, "New Ideas in Data," will feature video interviews with prominent data specialists and scientists. A special closed circuit TV will allow visitors at the exhibit site to see and hear the interviewees, some of whom will be in their laboratories and offices hundreds of miles away.

Visitors will have the opportunity to ask the personalities about new and future developments in their field. The daily interviews will be videotaped for additional showings.

Machine Punches And Embosses At Same Time

MINNEAPOLIS — At the SJCC, Data Card Corporation will demonstrate — for the first time — a new machine which simultaneously embosses self-writing characters and punches machine-sensible code holes into plastic credit cards at 1,500 card/hr.

The cards produced by this machine can be read automatically by data collection devices at the point of transaction. Readers can be either offline or online to computers, according to the company.

The embossed data on the cards is used to imprint invoices and other action or accounting documents at the point of sale — for human legibility, and for input to optical character recognition machines.

Also incorporated in the new data card embosser/encoder is a topper, a modular device for applying contrasting color to the top of the embossed characters to improve the legibility, appearance, and personal acceptability of the cards.

The use of computer-compatible magnetic tape, as the medium of input to the Series 1500, eliminates costly and time-consuming conversion processes now required in competitive systems.

The demonstrated Hollerith-code punching capability is only the first of several card-encoding options which Data Card will offer to the credit card field and related markets.

Other encoding techniques to be available later this year will include magnetic stripe encoding, based on specifications of the new automated reservation and ticketing system as developed for use by International Air Transport Association.

The modular design concept and the electronic logic enable Data Card to develop and incorporate these encoding options with a minimum investment in time and money.

The company will exhibit in SJCC booths 1508-9.

Also on view at the exhibit will be the Dataspeed magnetic tape terminal, the latest addition to the Dataspeed "family" of high-speed data transmission services. The new terminal, to be avail-

able in July, features a compact magnetic tape cartridge with a storage capacity of approximately 150,000 characters. It can send or receive at speeds up to 2,400 word/min.

Recent developments from the Bell Telephone Laboratories will be displayed, including "Magnetic Bubbles," tiny magnetic domains smaller than the diameter of a human hair. The bub-

bles may one day provide compact and inexpensive storage of processing for computers and telephone switching systems.

The company will exhibit in booth 2300.

Portable data terminals Under \$60 per pound

Today's most advanced portable remote data terminal comes from Omnitec... and it comes for less than \$1500. If you're thinking in OEM quantities, the cost gets lower and lower. This full conversational terminal weighs less than 25 lbs., complete with input keyboard, hard copy printer and telephone coupler. Put it in its rugged carrying case and you can take it anywhere; it's o.k. for airline carry-on. No matter where you are, all you need to stay in touch with your computer is an Omnitec data terminal, a telephone and an electric outlet. With full 63 character ASCII keyboard, Omnitec terminals are uniquely suited for remote data entry and information storage/retrieval applications. Also available in 2741 compatible model. Field proven. Off-the-shelf delivery. Try a demonstrator; your installation, our expense.



Now, in less than an hour, you can turn your Teletype® into an acoustic terminal using Omnitec's telephone coupler conversion kit. Costing only \$345.00 in quantities of 50, the kit offers the proven advantages of the world's leading acoustic couplers, the Omnitec 700 series, to all users of Teletype® computer terminals.



OMNITEC Another Nytronics Corporation

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See all Omnitec data communication products on display at SJCC. Or, write for descriptive literature.



Products on Show at Spring Joint

Drum Printer Costs \$9,500

LOS ANGELES — System designers and builders can obtain a new high-speed drum line printer from Data Products Corp., at this year's SJCC, according to the company.

Original equipment manufacturer quantities of the printer bring the price down to \$9,500.

The printer has a 132-column line, printed in six segments. Each 22-character segment requires one revolution of the drum. With a 64-character set, the printer can print at up to 1,110 line/min, the company said.

The printer is called the Model 2410 and will be on display at SJCC booth 1000.



Data Products' new printer prints a 132-column line at 1,110 line/min. The Model 2410 drum printer uses the company's special Mark IV printer hammers, according to the company.



AMCD Copy-Duplicator

A-M Exhibits New Data Entry Mag Tape System

ATLANTIC CITY, N.J. — Addressograph-Multigraph Corp. will be exhibiting a new computer entry system and one of its copiers at the show this year.

The A-M 6000 computer entry system features an on-line computer data entry capability without tape handling. The system consists of a small electronic memory and a control unit that can time-share up to six keyboard data entry stations and displays.

Data entered from these multiple keyboards is stored within the memory and groups of records can be recalled for verification and correction by any operator.

The keyboards are said to resemble standard keypunch stations closely, and to require little retraining for operators. Data entered or recalled is displayed in large-format characters at the station.

Where on-line data entry is not feasible, an IBM-compatible 7- or 9-track tape drive may be attached to the system.

A-M is also demonstrating the 9650 code scanner that reads documents imprinted with either fields of A-M bar code, Hollerith punched data, or combinations of both.

The Copier-Duplicator Division will be demonstrating a completely automatic copier that makes clean black copies on standard white paper at the rate of 90 copy/min, 5,400 copy/hr.

Addressograph-Multigraph will exhibit in SJCC booths 1101-07.



CalComp presents a brilliant new film producer.

Up until now, you could buy your computer either a brilliant and versatile microfilm plotter.

Or a brilliant and high speed microfilm printer.

But you couldn't buy, for any reasonable amount of money, one film output system that was both.

Now you can.

CalComp presents the 1670 COM system. It's a plotter.

CalComp's new offline 1670 COM system is the finest Computer Output Microfilm plotter you can buy.

It draws at a rate of 500,000 increments a second.

Features a programmable raster of 16,384 by 16,384 positions. The finest resolution available.

And cuts tape write time to a tenth or better over previous microfilm systems.

With twenty usable line widths, the 1670 COM system is ready to

draw practically anything.

And with the support of CalComp's extensive library of basic, functional and application software, it practically can.

CalComp presents the 1670 COM system. It's a printer.

If your primary need is for a high speed printer, the CalComp 1670 COM system is that, too.

System throughput, using hardware character generation, is 7,000 to 12,000 lines per minute.

And with CalComp software you can put it in any type font, size, or language you like.

With an optional forms projector, you have 16 program selectable forms.

And take your choice of cameras. 16 or 35mm. Sprocketed or unsprocketed. Even a 105mm microfiche option.

So if you haven't

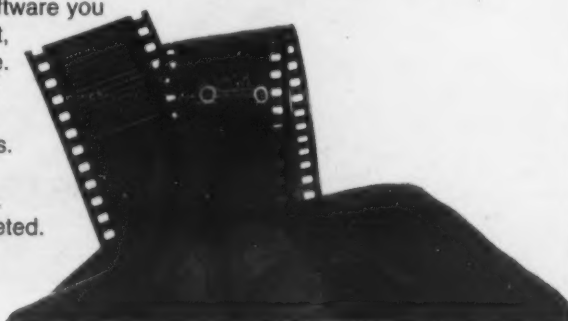
been able to decide between a microfilm system that *plots* or one that *prints*, call your nearest CalComp man today. (CalComp has offices in 34 cities.)

And tell him you want to discuss the brilliant new producer that does both.

CALCOMP

TEACH YOUR COMPUTER TO DRAW.

California Computer Products, Inc., Dept. W-5
2411 West La Palma Ave., Anaheim, California 92801



A-M 6000

PF-40DM-8 Digitizer Permits Insertion

SILVER SPRINGS, Md. — Edwin Industries Corp. has announced demonstration of the Model PF-40DM-8 Graphic Coordinate Digitizer at the SJCC.

This system features built-in grid recognition and incremental modes as a part of the standard package. A standard 160-key keyboard allows the operator to insert data, other than coordinate data, on the magnetic tape, paper tape, punch card, or typewriter. A variety of applications may be run on the system.

Prices range from \$17,000 to \$28,000 with standard 60-day delivery.

Edwin Industries will exhibit in SJCC booth 35008.

Products on Show at Spring Joint

Iodisk Series 2000 Stores Up to 96 Million Bits

SANTA CLARA, Calif. — The Iodisk Series 2000 removable disk systems from Iomec, Inc. doubles the storage density of the existing Iodisk 1000 and reduces the access time to 70 msec, according to company president Harold Eden.

The 2000 will be introduced at

Mbits on two removable cartridges and one fixed disk operating on two drives. The 2024, largest of the new systems, has 96-Mbit capacity on two removable cartridges and two fixed disks operating on two drives.

Series 2000 uses 2,200 bit/in. recording technology, double the density of Series 1000. The two systems in the 1000 series have capacities of 11 and 22 Mbits.

"With our new and existing systems," Eden said, "we can offer computer manufacturers

single-unit disk storage systems with anywhere from 11 to 96 Mbits."

Marketing Vice-President Avery F. Blake Jr. listed high-performance features: servomechanism with voice coil actuator; an absolute air filtration system capable of trapping even infinitesimal smog particles; data transfer rate of 1.56 Mbit/sec; 70-msec average access time; extended operating temperature range; and mechanical simplicity.

"One of our most important features," Blake added, "is the combination of removable disk

cartridges and fixed disks on three of the five new systems (2012, 2023, and 2024).

"This gives users the ability to exchange data between disks," he said. "While using the removable disk cartridges for data I/O, the fixed disks can be used for storing programs, subroutines, computation tables, transaction data, and so forth. This allows a single Iodisk system to handle many applications normally requiring several drives."

Blake sees a tremendous market for the 48-Mbit capacity 2012 system because "the 2012

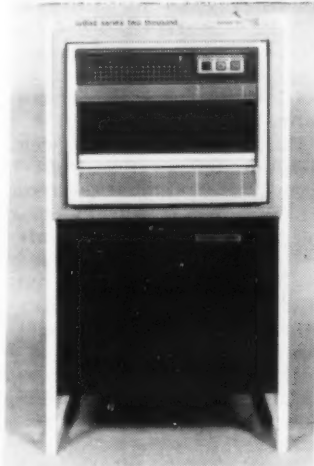
has about 85% of the capacity of 2311-type drives," he said, "but with greater flexibility."

Controllers for interfacing Series 2000 systems with various computers are in production, according to the company. One Iodisk controller services up to four drives.

Iomec feels that the new disk systems will fit into a broad range of applications, including commercial data processing.

Delivery is expected to be 150 days from receipt of order.

Iomec will exhibit in SJCC booths 4004-6.



Iodisk 2012 disc data storage system. the SJCC.

The new disk storage systems range in capacity from 24 to 96 million bits and use either removable disk cartridges or combinations of removable cartridges and fixed disks.

Mixed Usage

Iodisk 2011, smallest of the new units, has a capacity of 24 Mbits on one removable disk cartridge operating on one drive. The 2012 has 48-Mbit capacity on one removable cartridge and one fixed disk operating on one drive.

The 2022 also has 48-Mbit capacity, but on two removable cartridges operating on two drives. The 2023 goes up to 72

'Preview' Shows Report Likeness

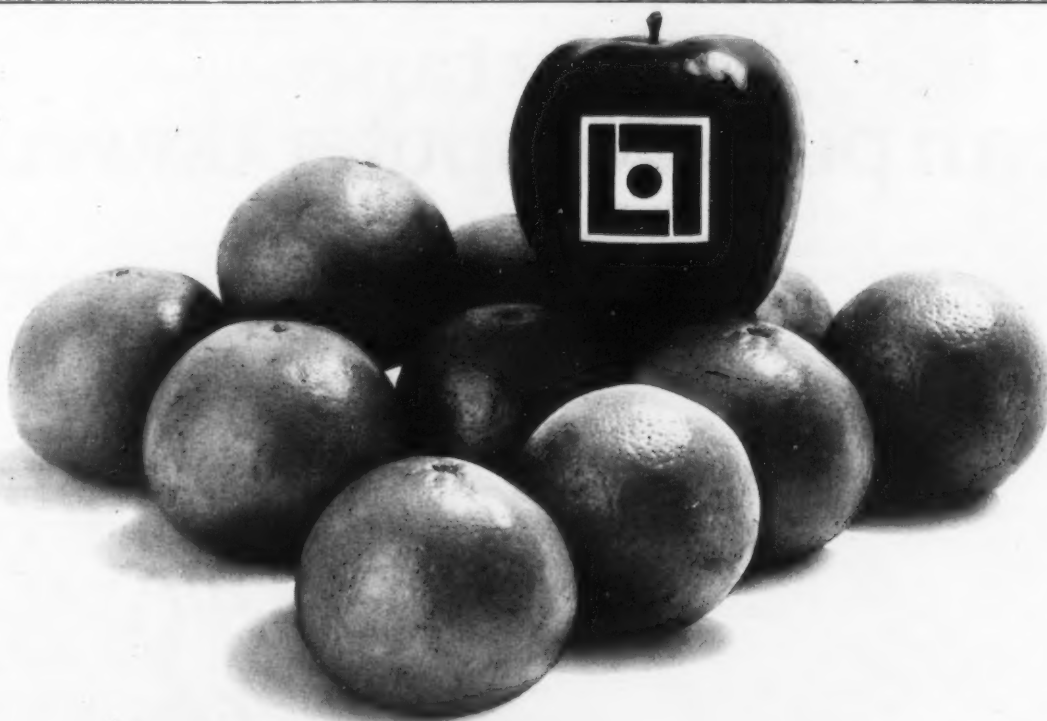
NEW YORK — System Implementation Corp. has developed a program called Preview that produces actual machine-generated hard-copy reports of proposed systems. Preview permits management to visualize the reports before programming.

Specially prepared print/layout forms have been developed to facilitate the design of the print format. These forms allow the report designer to lay out his formats on the same sheet that is to be sent to the keypunch department.

All that is needed in addition to the data items is a control area that will monitor spacing and text placement. Revisions to the formats are quick and easy before actual programming begins, the company said.

Preview has been designed for the 360/30, DOS, and is written in BAL.

System Implementation Corp. supplies source deck, listing, user's manual, and the special forms for \$75. The company is at 18 E. 48th St.



Logically speaking... you can't compare apples with oranges.

There is only one "big apple" to be bought in the data input market.

It's Logic's LC-720 KeyDisc Data Input System.

The LC-720 is a "whole" system... the most advanced, compatible, flexible and versatile system of its kind.

It has a whole range of applications and performs a broad-spectrum function.

But don't get it mixed up with those limited, basic systems designed for limited, basic use.

However, if you're shopping for a limited, basic system, we'll provide you with one that incorporates many of the advanced features of the LC-720.

Another shopping tip to remember... the LC-720 KeyDisc Data Input System

can save you up to 50% of data preparation costs. And logically speaking, money saved is money earned.

Lewis Barr at Logic will tell you why the LC-720, big or small, is the best in the market. Call him at 609-424-3150.

It's the logical thing to do.

LC-720 KeyDisc System



21 Olney Avenue • Cherry Hill Industrial Park • Cherry Hill, N.J. 08034 • (609) 424-3150

Products on Show at Spring Joint



Computer Business System-4

CBS Is Customized to Fit Needs

WASHINGTON, D.C. — EDP Technology, Inc. is exhibiting two customized data processing systems, the Computer Business System (CBS) and the Graphics II Plotter System.

CBS is a low-cost business system designed to fulfill the bookkeeping and general ledger accounting requirements of small businesses and professional accounting firms. CBS is a compact system integrating a 400 char/sec Digitronics paper tape reader, a Teletype ASR-33 keyboard/printer, a paper tape

reader/punch, and an 8K Nova computer.

All software and hardware interfaces are designed and built by EDP Technology. The software system is fully documented and offers the user the necessary flexibility to satisfy his own input/output format needs, the company said.

System outputs include the detail journal, general ledger, balance sheet, income statement, branch reports, subsidiary ledgers, payroll summary, working trail balance and Form 941A

and W-2 reports. Operator training requires no prior computer or accounting machine skills. Complete system purchase prices start at \$16,000.

Optional hardware is also displayed which provides higher performance. These include the Univac 30 char/sec keyboard/printer and up to three ICP cassette magnetic tape drives capable of 600 char/sec transfer rates and storage capacity of up to 250,000 characters per cassette.

The Graphics II plotter system demonstrates a stock market analysis application. One version of the system is currently being used by Chart Service Institute, Winter Park, Florida to develop precise analyses of NYSE, ASE and OTC stock issues from daily stock market data, in graphic form, the company said.

The system develops daily resistance and support information for each of 1400 stocks.

The SJCC configuration consists of a Nova, CartriFile magnetic cartridge tape drives, Teletype keyboard/printer and one Houston Instruments plotter. A second plotter, communications adapters and other options are available.

With company-modified software, the Graphics II Plotter System has a wide range of capabilities for engineering, inventory control, sales analysis and similar graphics-oriented applications.

The company offers a range of engineering and programming capabilities to integrate a variety of additional low-cost OEM components with the Data General Nova as well as other small computers.

These include an IBM 2311-compatible disk drive, a high-speed Alpha Data 250,000 character disk drive, a GDI 300 card/min reader, an audio response unit, a high speed printer, and communications adapters. Many of these units will be on display at the SJCC. Prices for EDP/T Systems, hardware/software options, and maintenance contracts are available upon request.

The company will exhibit in SJCC booth 45001.

Bit 483 Mini Has Decimal Or Binary Math

NATICK, Mass. — Bit, Inc. will feature its 483 minicomputer at the SJCC.

The 483, first deliveries of which were made this January, has features which include: the ability to compute in both binary and decimal arithmetic, signed and unsigned; medium scale integration circuitry; a high speed internal core memory with a cycle time below 1 μ sec; a variable word length capability which simplifies programming.

Bit's exhibit will be in SJCC booths 46020-21.

A dirty tape can put a computer down.

Depressing. Dirty tape causes data dropouts. And dropouts cost you money. That's a bad scene.

RCA Computer Tape helps keep computers up.

It's a special formulation that

starts cleaner. Every inch of every reel is tested and certified in the cleanest of white-room conditions. (No statistical testing for us.)

And it stays cleaner, longer.

Result? Fewer dropouts, more

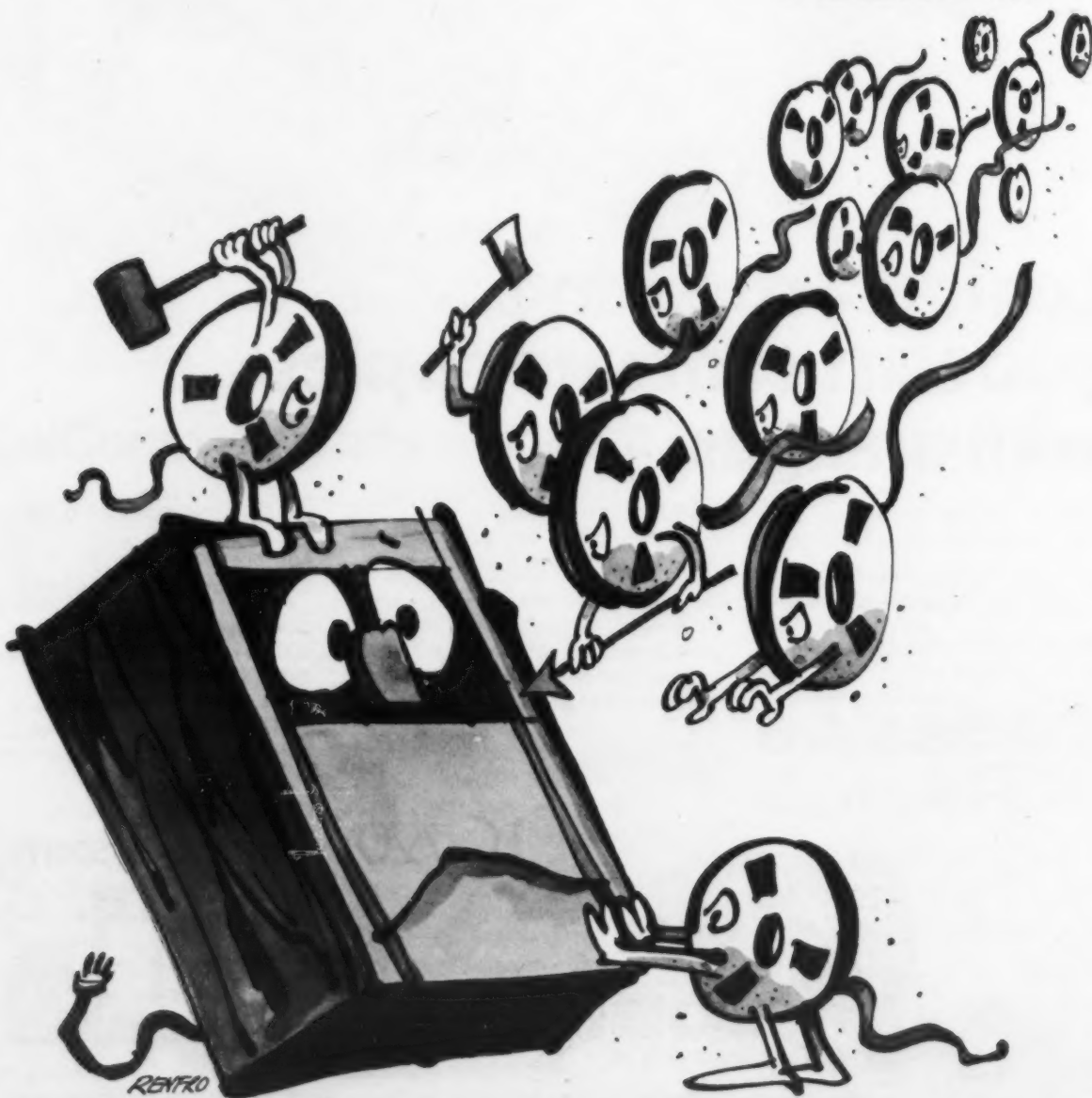
efficient computing.

Show your computer what a good scene really is. Write

RCA Magnetic Products, 201 E. 50th St., New York 10022.

Our tape makes it.

RCA Computer Tape



RENTRO

DIGITAL SYSTEMS from TI

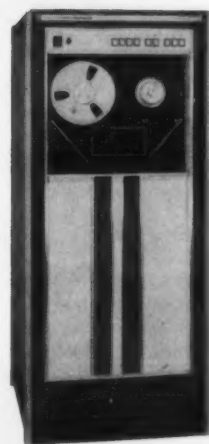
Plug-to-plugin compatible tape units for System/360

Series 924 combines economy with improved reliability and MTBF for effective replacement of original equipment. Improved tape path and single capstan drive provide oxide contact only at the head, insuring increased tape life, better data integrity.



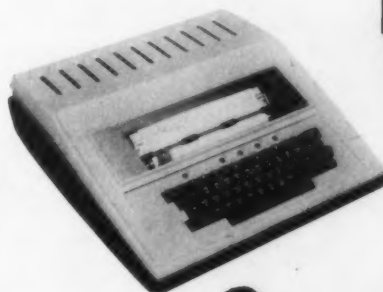
Advanced tape units for original equipment manufacturers

Series 959 combines design simplicity, reliability and MTBF characteristics of the Series 924 with a fully deskewed digital interface desired by the O.E.M. Basic design offers cost effective operation, with electronic controls that replace mechanical parts, reduce maintenance needs.



Data terminals for telecommunications, computer input/output

Electronic Data Terminals from TI are fast (up to 400 wpm, 40 cps), quiet (non-impact electronic printing), attractive replacements for noisy mechanical types. Compatible with Teletype and IBM 1050 or 2741 terminals.



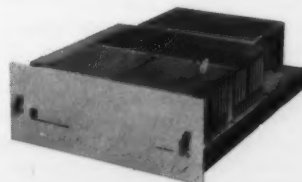
A message switching computer system for small and medium-scale communications systems

The **980/EMS** is an economical, fast, efficient stored-program system that handles from 4 to 128 circuits on private-wire and public-switched networks.



Magnetic core memory systems for computer mainframe and system design

Model 900 systems are modular, rackmounting chassis units that add from 4K to 65K memory capacity to computer systems. Feature solid-state circuitry, interchangeable plug-in PC cards.



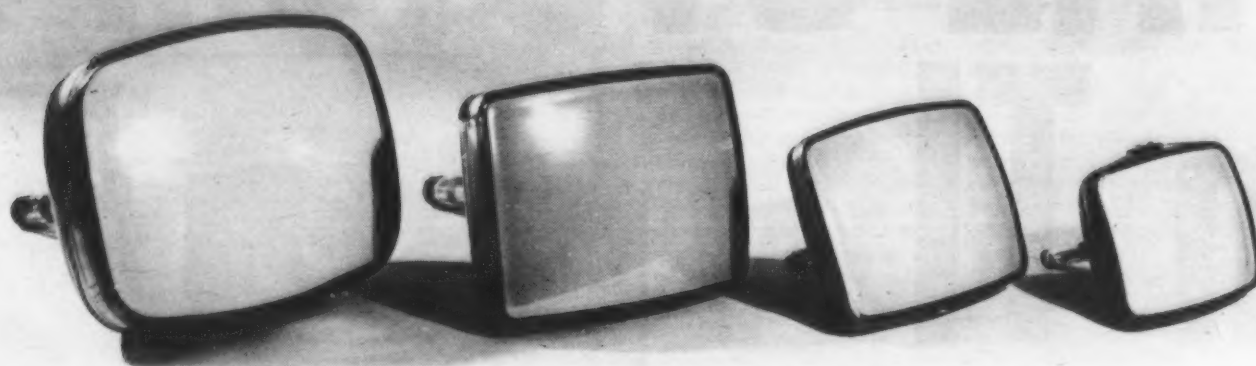
SEE TI'S BOOTH AA, AISLE 5700 · SPRING JOINT COMPUTER CONFERENCE · ATLANTIC CITY



**TEXAS INSTRUMENTS
INCORPORATED**

DIGITAL SYSTEMS DIVISION • (713) 526-1411 • P.O. BOX 66027, HOUSTON, TEXAS 77006

Products on Show at Spring Joint



GE 17-in. Y4045, 15-in. Y4044, 12-in. Y4076, and 10-in. 10ARP7 Monitor Tubes

GE to Show 5 CRT Tubes For Displays

OWENSBORO, Ky. — Five new GE devices for the DP industry will be exhibited for the first time at the SJCC.

GE's tube department will exhibit:

- Y4028 — GE's new 3/4-in., light-weight, low-cost CRT designed for computer data retrieval, data display, electronic calculators, telecommunications equipment, and management information systems.

- A two-phosphor, multicolor, single gun CRT for applications where multicolor display can facilitate comprehension, such as computer readouts and electronic test equipment.

- Y1938, a new low-voltage indicator tube capable of displaying numbers with seven fluorescent segments for use in computer readouts, frequency counters, digital voltmeters, and desk calculators.

- Y4044 15-in. and Y4045 17-in. magnetic focus and deflection tubes. Offering resolution and brightness superior to competitive tubes of similar sizes, these new CRTs are geared for applications that include high quality computer readouts as well as sophisticated monitoring systems, the company said.

The Y4028 3/4 in. CRT offers low design cost (inexpensive to "design in") and portability (lightweight). Other features include: complete alphanumeric and symbolic display capability when used with appropriate circuitry; single-plane CRT viewing; clearly legible characters; capability of displaying TV signals on the tube face.

The new multicolor single-layer phosphor CRT provides higher resolution than shadow mask tubes. Design advantages include display uniformity; easier, more economical manufacture (than a tube with separate phosphor layers); adaptability to any available CRT envelope.

GE's new Y1938 is a seven-bar segment, vacuum fluorescent readout tube that offers original equipment manufacturers several major advantages over competitive display devices. It has a more rigid structure with fluorescent bar segments contained on a solid substrate. It operates at 25 volts anode, compared to up to 170 volts for some competitive display tubes. It is compatible with solid state devices and can be driven by integrated circuits.

GE's new 15-in. Y4044 and 17-in. Y4045 offer 70-degree deflection, resolution of .002 in. at 50 microamps. Offered with aluminized P4 phosphor screen, and 52% transmission face panel, both tubes can be manufactured with any available phosphor.



Our new \$20,900 remote batch terminal interfaces with almost everybody

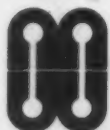
It takes an intelligent terminal to team up with the most important CPUs in the industry... and that's just what our new brain truster does. It will trade data with the IBM System 360, UNIVAC 1108, RCA Spectra 70 series, Control Data 3000 and 6000 series, XDS Sigma series, General Electric 400 and 600 series, Digital Equipment's PDP 10, plus less well known names. You can also sneak in some on-site

data processing because our new progeny has a 4Kx16 memory of its own, and you can add more in 4K increments. Other bright spots in its personality include: 2000 bits/sec dial-up and 2400, 4800, 9600 bits/sec leased line, half or full duplex operation (2 or 4 wire), EBCDIC, ASCII and Transcode operator selectable, terminal to terminal communication and interfacing for a wide variety of periph-

erals which can be added anytime without wiring modifications.

Further proof of its brilliance is borne out by the fact that auto answering for dial-up lines, automatic turnaround, multiple record transmission, horizontal format control, EBCDIC transparency and multipoint line control are all included in the basic price.

Call for details, and be sure to see the smartest terminal at the show.



M&M COMPUTER INDUSTRIES, INC.
770 North Main Street, Orange, California 92667 (714) 639-1134

Seaside Terrace Hotel — Atlantic City
May 5, 6, 7 — 12 Noon 'til...
Ask at the desk for the suite number

Products on Show at Spring Joint

Infoton Terminal Reads OCR-A, Rents From \$1,000/Mo

BURLINGTON, Mass. — Infoton, Inc. is introducing an optical recognition data terminal at this year's SJCC.

The terminal is a hand-fed document scanner that accepts up to 11 in. by 14 in. documents at 12 line/sec, the company said.

The first version of this series of machines will read the OCR-A standard character font. Future versions are expected to read OCR-B, hand printing, mark sense, and standard typewriter elite and pica fonts.

The initial versions will lease starting at about \$1,000/mo, the company said. Purchase prices

will start at about \$30,000 plus maintenance. First deliveries are scheduled for this July with about four or five month's delivery cycle.

One of the machines will be

able to read lines that are variably spaced. The line scanning reader has a wired program controller that scans each line separately. Lines are read from side to side, and reading areas will be

delimitable by tabs, masks, or character delimiters.

The OCR terminal is based on the company's previous work with CRT displays and CRT tubes. The reading scanner, if it

cannot recognize a character, will display the unrecognizable character on a display tube for operator explanation.

Infoton will be displaying in SJCC booths 52008-10.

CRT Terminal Does Both Graphic, Alpha Generation

ATLANTIC CITY — Monitor Displays will be exhibiting a new graphics terminal at the SJCC. The CRT terminal 8190 is housed in a self-contained desk-style cabinet. It displays alphanumeric and graphic pictures on a CRT graphics monitor, and features a character generator (10 μ sec character writing time), a vector generator with a resolution of 1 bit in 1,024, and a writing time of 5 μ sec/in., a position generator, and a CRT with setting time of 14 μ sec.

This unit can be interfaced to a display processor or computer interface, a computer with refresh memory, or a cursor movement device (such as light pen, track ball, keyboard), to become an interactive graphics display terminal. Unit price is \$19,975.

In addition to the 8190, Monitor Displays is also exhibiting color video and will show color video graphics. The company is in SJCC booths 5725-26.

'Fore' Designed For File Upkeep

LOS ANGELES — File operations in a rush environment (Fore) is the name of Allen-Babcock Computing's newest software package for the Rush/PL/I system to be shown at the SJCC.

Fore provides a dialog between the user and the computer that is designed for record and data manipulation, file maintenance, report generation, and predefinition of report formats.

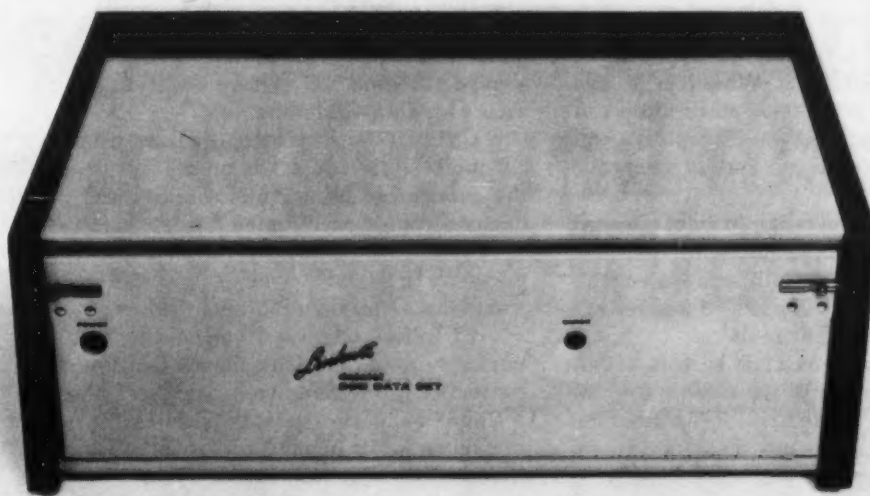
Printout reports may be obtained either at the high-speed printer in the Rush center or at the user's IBM 2741 terminal.

Fore files can contain information of any type in nearly any organization.

Fore can work in conjunction with other software systems, or as a stand-alone system.

Rush is a PL/I oriented time-sharing service providing a specialized subset of the IBM PL/I language and general-purpose file and language capabilities. It will be on display in SJCC booths 46022-23.

Introducing the first 4800 bps data modem that acts like one.



The new Lenkurt 26D delivers what other 4800 bps data modems promise.

With the 26D you'll get higher throughput and have fewer errors to contend with.

The reason is Lenkurt's unique correlative coding which employs a modified duobinary technique. It compresses the required bandwidth and uses a simpler signal with fewer amplitude levels. So there's a much better signal-to-noise ratio.

The results: Fewer errors. More throughput. Reduced transmission costs.

And the 26D has other features you'll appreciate.

An optional 150-bps secondary channel is available for error control. And automatic error detection to eliminate redundant parity

check bits (another bonus of the correlative method).

There are also built-in facilities to simplify alignment and permit faults to be located in the data terminal, the line, or the data set.

The 26D can be arranged for simplex, half-duplex, or full-duplex operation. It will operate over any C2 conditioned voice channel. And it is fully compatible with EIA standards, CCITT recommendations, and MIL standards.

So if you've been looking for a 4800 bps data modem that really acts like one, take a good look at the new 26D.

LENKURT ELECTRIC
GENERAL TELEPHONE & ELECTRONICS

It delivers.
Write Lenkurt Electric Co., Inc.
Dept. C720, 1105 County Road,
San Carlos, California 94070.

Data Transmission Systems from Lenkurt

Concept and design



Gilbert F. Curtis

An honors graduate of Princeton, Gil Curtis is perhaps the industry's most skilled designer of generalized business software systems. Certainly Curtis-designed systems are operating very successfully in literally hundreds of major corporations throughout the U. S.

From this experience evolved the obvious need for a powerful report generator. One that would be easy to use, yet so powerful and fast it could be used as a report utility as well as for on-demand reports. In other words... CULPRIT.

Design and implementation

Anna Marie was literally a co-designer of CULPRIT and the major implementor. A skilled programmer, Anna Marie was able to perform basic CULPRIT functions in virtually I/O time, thus making CULPRIT unbelievably fast.

Anna Marie was at one time a member of the staff of Arthur D. Little, Inc., engaged in product development. Later, she spent a number of years in software design and development. Mrs. Thron holds a B.A. degree in chemistry from Beaver College, Pa.

Anna Marie Thron



Interface with data base language



James J. Baker

Jim Baker is an M.I.T. graduate (math major and honor society member) who has completed requirements for his Phd at Harvard.

Prior to joining Cullinane Corporation, Jim spent 5 years in advanced software system development at I.B.M. Therefore, Jim was the logical choice to develop the IMS/data language 1 interface module... which allowed CULPRIT to enhance the report generator capability of DL 1.

Jim was also a major contributor to the OS version of CULPRIT.

Documentation

An engineer with a B.S. in E.E. from Michigan State, Ken spent many years in electronics research and software review and evaluation before joining Cullinane Corporation.

He authors a monthly column on software for Modern Data magazine and knows exactly what the user looks for in terms of really effective documentation.

So when Ken wrote the user's manual for CULPRIT he put himself entirely in the user's position. Example: he devoted a major effort to a self-teaching section for junior level personnel... but at the same time included substantial material for the advanced CULPRIT user.

Kenneth Falor



Meet the people behind the most important software package of 1970: new CULPRIT.

Before many months are out the chances are you'll be using CULPRIT. Wherever it has been shown it has generated intense interest. The list of sales is growing quite rapidly. And it is the type of package literally everyone needs.

So we thought you'd like to meet a few of the more important people behind it. There are others. Perhaps a dozen Cullinane staff members had some part in CULPRIT. But these are the four who deserve the credit.

CULPRIT brought us a few surprises. Particularly in speed. While we designed it for flexibility and ease in use CULPRIT turned out to be much faster than our most optimistic estimates. Otherwise it performs exactly as planned.

And what we planned was an easy-to-use report generator and information retrieval system that would allow you to respond to on-demand report requests regardless of report complexity. One that was so efficient it could be used as the report utility in production systems.

How CULPRIT differs

Many report generators can produce only one report from one pass of the data file. Others produce a Cobol program which must be com-

plied, link edited and run before they produce a report. Some even have both problems. That's Model T designing!

CULPRIT is a parameter-driven program. No compiling needed. The program is kept on the core image library like a utility and produces a report as directed by the parameter coding. Highly efficient, it produces many reports (up to 99) with a single pass and can extract from multiple input files.

CULPRIT requires from 1/10 to 1/40 the normal coding time. This means that the most junior-level programmer can request and get a simple one-time report in minutes. Or many complex reports in one pass... with just a few hours of coding. Not weeks. Hours! But fast reports are not all that CULPRIT can do for you.

New Systems

When you design a new system, how much of it is made up of report editing programs? Half? A third? Then you can put your new system on the air nearly one-third to one-half sooner by simply plugging new CULPRIT into the system to handle the reporting requirements. You not only save programming time, but the machine time usually needed for debugging this part of the system.

Processing speeds are close to those for well-designed and laboriously hand-coded programs. Remember... this isn't an ordinary report generator. You just load and go.

Features

CULPRIT has multi-line output for address labels, notices, etc. Other options include header variables; multiple-lines in headers, detail and totals; separately specifiable total lines; calculation ability on both detail and total levels; use of mnemonics for working fields; and many others. Output may be printer, punched cards, tape or disk... permitting program and test file creation and conversion.

Find out for yourself!

Send for a complete 15 page technical report. Or, if you'd rather discuss CULPRIT directly with one of the above people (or equally well-qualified Cullinane staff members), pick up your phone and dial (617) 742-8656. You really ought to know about CULPRIT. Don't pass up the chance!



Name.....
Title.....
Company.....
Address.....
City.....State.....Zip.....
Phone.....



Cullinane Corporation

Products on Show at Spring Joint

Fasplot Works as Drum, Flat-Bed Plotter

RICHARDSON, Texas—The Fasplot Analog Plotter is capable of high-speed plotting when used in conjunction with Teletype terminals in computer systems, according to the manufacturer, Omega-T Systems Inc.

Combining solid-state control circuitry with an analog recorder, Fasplot can draw a straight line rapidly in any direction with

a minimum number of commands.

An automatically segmenting mode may be selected for either the X- or Y-axis, which enables the plotter to quickly create graphs composed of preset increments representing months, dollar amounts, or anything readily divisible into equal segments.

Affording a tiltable plotting bed up to 90°, the Fasplot has an operational plotting speed of 10 in./sec.

For on- or off-line use, the Fasplot's input format enables an operator to develop graphs

without special training in programming.

For use on any size paper up to 11 in. by 17 in., Fasplot uses a vacuum to hold paper in place. The unit is available with either a felt-tip pen or a liquid ink pen.

Fasplot may be purchased outright or leased through time-sharing service companies or through companies specializing in the leasing of computer peripheral equipment. Complete software packages are available on request.

The company will exhibit in SJCC booth 10010.



Omega-T's Fasplot System

Terminal Reads Punched Cards

NORTHRIDGE, Calif.—Electronic Arrays plans to introduce four new products at the show.

A low-cost computer terminal device designed for use in digital data acquisition and management networks will be shown. The unit provides capabilities for entry and printout of fixed and variable alphanumeric data and/or query responses with simultaneous printout of the alphanumeric data.

Communication is in Ascii and is applicable to all computer systems designed to service remote teletypewriters, the company said. The unit contains a 12-pushbutton keyboard, a reader for plastic punched cards, a strip printer and an acoustic coupler. Many optional devices are available.

Mostak I memory is a 512-word, 4-bit word random access read/write memory with a 0.8 μ sec maximum read access time and a 1 μ sec cycle time. Mostak I employs monolithic MOS random access memory devices manufactured by Electronic Arrays for the data storage and the majority of the address decoding. The board is 6-3/4 in. by 4-1/4 in. The unit offers non-destructive readout, expandability to 16K words, TTL I/O levels and all address decoding and clock drivers.

Mostak II is a 1K-word, 8-bit word memory with a full cycle time of 1 μ sec. Like Mostak I, Mostak II employs monolithic MOS random access memory devices. The system is a two-board arrangement with one board containing the clocking and timing system while the second board contains the memory array.

The unit can be used as a direct replacement for core memory of comparable size with the advantages of non-destructive readout, smaller size consideration, wider temperature range, simpler interface logic, and lower power requirements, the company stated.

ROM Simulator is a device to simulate patterns in logic design utilizing read-only memories. The unit can simulate up to 512-word by 48-bit read-only memories. The unit is designed to plug into normal ROM sockets and to function exactly as an ROM would.

Electronic Arrays is to exhibit in SJCC booths 3008-9.



Now... *accelerated* converts your tapes and discs to microfilm

Important 4th generation breakthrough! Thanks to ACCELERATED Information Services, your computer can become what it was always meant to be: a full-time computer instead of a part-time slave printer.

ACCELERATED Information Services is a subsidiary of JTC (Jersey Tab Card Corp.), one of America's leading computer supply companies. Our new Kodak KOM-90 converts computer output to microfilm for quick and convenient retrieval. Advantages?

- ... The KOM-90 prints twenty times faster than your computer
- ... enables you to retrieve information at least nine times as fast
- ... provides you with a microfilm magazine that weighs only six ounces, takes up as much space as a mag tape mini-reel—yet contains the equivalent of twenty pounds (2,000 pages) of computer paper printout!

Microfilm doesn't have to be decollated, burst or bound. And when selective paper copies are required, a microfilm reader-printer can turn them out fast. You can also combine information from your computer with artwork or permanent data—for price lists, catalogs, etc.

ACCELERATED's executive and sales engineers are all computer and microfilm specialists. They'll discuss your requirements and equipment with you... help you convert your computer output to microfilm as economically as possible... and stay on the job to make sure your new set-up is working smoothly.

Because our KOM-90 operates right on our own premises, and we have our own trucks, we provide fastest service possible: pickup, conversion, delivery—all within 24 hours in most cases.

Take this important step toward maximum efficiency of your computer operation. Call or write for more information today.

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A subsidiary of JTC (Jersey Tab Card Corporation)

Products on Show at Spring Joint

ATC 2000 Display CRTs Are IBM/360-Compatible

NEW YORK — MAI Equipment Corp. will demonstrate its ATC 200 CRT display terminal and the 100 Data Transcriber at the SJCC.

The ATC 2000 displays 1920 characters of high visibility, the company said, through the use of combined cursive character drawing and electronic beam deflection. The 2000 is compatible with the IBM/360, the firm said. The 100 data transcriber is a

flexible system for reducing data entry costs, the company said. The unit records input of magnetic tape cartridges, and displays all entered information. The cartridges use standard 1/2 in. computer tape. The unit can display either the character and the relative column number, or it can display the entire current record.

The company will be exhibiting in SJCC booths 2008-9.



MAI ATC 2000

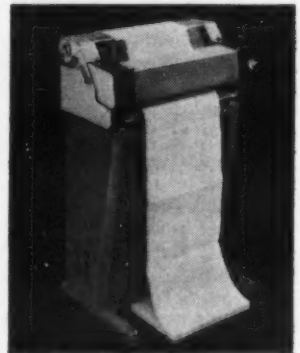
V-132 Printer Has Variable-Width Lines

BOSTON — Data Printer Corp., has recently introduced its V-132 variable width machine to its growing line of medium-speed line printers.

Capable of accommodating form widths varying from 3-1/2 in. to a full 19-1/2 in., the V-132 features 600 line/min printer mechanism, pedestal mounted electronics buffered with a single line memory, and an 8-channel vertical format unit.

A sound deadening cabinet is also available. The V-132 is also available as mechanism only.

The V-132 incorporates the same operational and design characteristics as the Data Printer F-80 and F-132 fixed width models. It will be on display in SJCC booth 43013-14.



Data Printer F-132

SCORE


ANCHOR HOCKING
CORPORATION

Leicester, Ohio 43120
February 9, 1970

Mr. Robert P. Wolk
Vice President-Marketing
Atlantic Software, Inc.
Lafayette Building
5th & Chestnut Streets
Philadelphia, Pennsylvania 19106

Dear Bob:

SCORE has done it again!

After a very careful analysis of SCORE and a direct comparison with IBM's COBOL and RPG languages, we are convinced of the tremendous advantages SCORE will provide our Anchor Hocking system development efforts.

Using a very controlled environment, we have taken four actual program requests in our backlog of work, and coded, keypunched, compiled, tested and obtained valid results, using COBOL, RPG, and SCORE. Here at Anchor Hocking COBOL is our primary language, while RPG's use is limited to one-time programs.

The results clearly demonstrated that SCORE can provide outstanding time and dollar savings over COBOL and RPG. A brief summary of the results of our analysis is shown below:

	RPG	COBOL	SCORE
Programming	11.8	22.8	4.0
Keypunching	4.1	7.3	.5
Computer Time	1.9	1.7	1.0
TOTAL HOURS	17.8	31.8	5.5

SCORE's PERFORMANCE RATIO IS 6 TO 1 OVER COBOL!

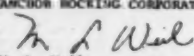
We have taken these performance ratios and used them to calculate actual savings based on known backlog of work in 1970. The savings are double the price of SCORE in 1970 alone.

SCORE will be used as a tool to accelerate EAM and 1401 conversion efforts, as well as assist us to handle one-time report requests more promptly. It will also be a great help for our new systems development projects because it generates a COBOL source program.

You've got a winner in SCORE -- and here at Anchor Hocking SCORE will help to make us a winner, too.

Yours very truly,

ANCHOR HOCKING CORPORATION


M. L. Weil
Director, Management Information Services

If you're curious about SCORE,
come to one of our seminars
and find out about it.

- May 5 Indianapolis
Memphis
- May 6 Chicago
Dallas
- May 7 Milwaukee
Houston
Philadelphia
- May 12 San Francisco
Pittsburgh
- May 13 Los Angeles
Cleveland
- May 14 San Diego
Detroit
- May 19 Baltimore
Albany
- May 20 Washington
Boston
- May 21 Hartford
Philadelphia
- May 26 St. Louis
- May 27 Kansas City
- May 28 Cincinnati

In New York City, contact

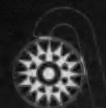
Programming Methods Inc.

51 Madison Ave., New York N. Y. 10010
Edward Opengart, V. P., 212 889-4200

All other areas contact

Atlantic Software Inc.

Lafayette Bldg., 5th & Chestnut Sts.
Philadelphia, Pa. 19106
Robert P. Wolk, V. P., 215 925-8424



____ I plan to attend the seminar in ____
____ Send details and literature on SCORE.

Name _____
Title _____
Company _____
Street _____
City, State, Zip _____
Phone _____

Water Well Accounts

DAVIS, Calif. — An EDP accounting system designed exclusively for the water well industry has been developed by *The Driller*, a publication representing water well contractors in the U.S. and AgData Inc., a firm specializing in agricultural software and data processing.

The user can choose from two systems in the program, called Drill/Data. System I provides monthly facts on income and expenses, depreciation and cash flow, and annual business analysis reports.

System II offers complete cost accounting and financial records.

The computerized bookkeeping service is offered by *The Driller*, which has headquarters at 610 S. Cook St., Barrington, Ill.

New Products Designed

BETHESDA, Md. — A service that is said to specify the design of new products or services, minimize uncertainty in the pre-testing of products, and improve advertising decisions, has been developed by Resource Management Corp.

Called PreMart, this technique produces a model of a market performance of a new item, a modified existing item, or a series of items, the company said. On the basis of the model, the design and image of a new product can be specified such that its market share is made as large as possible.

At this price, there are no options.

\$9950.

Buy two Spiras-65 computers at this new low price (per unit) and put away your wallet. We aren't going to put the bite on you for any major options. Because all major high-performance features are already built into the Spiras-65:

- 4K 16 bit memory expandable to 65K
- Hardware arithmetic with double precision and floating point
- Block transfer DMC
- Direct memory access
- Hardware priority interrupt
- 200+ instruction set cast in expandable ROM
- Indirect addressing to 32K
- Page free relative addressing ± 512 words
- Fully commented software
- Software supported peripherals
- Nationwide service
- 3 week customer training course

All these powerful capabilities are standards with Spiras. So whether you buy one unit at the new low single-purchase price of 12,400, 2 units at 9950 each, 30 units at 8500 each, or 100 units at 7000 each, you get all the versatility and expandability you're ever likely to need.

And no options.

Visit our booth at the Spring Joint Computer Conference, booths 118 and 119



Spiras Systems, Inc.
Affiliate of
USM Corporation

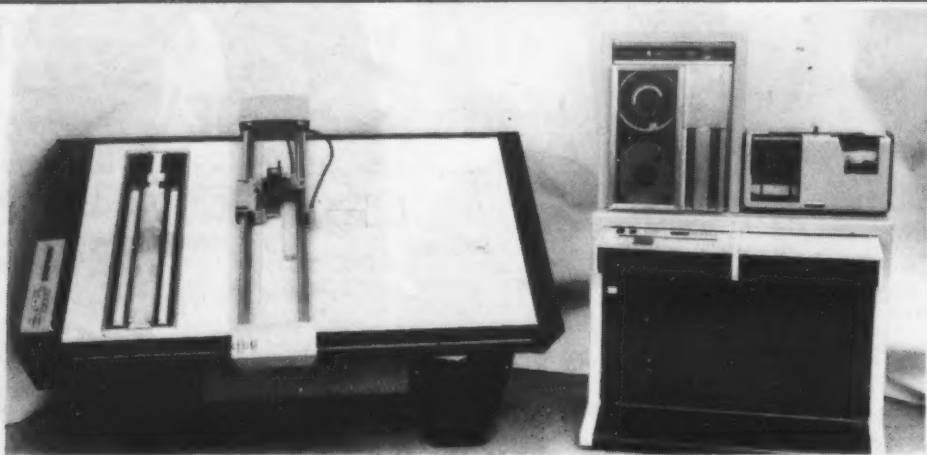
Request For Quote

Send to: R. Frederickson,
Vice-President/Marketing,
Spiras Systems, Inc., 332 Second Avenue,
Waltham, Mass. Telephone: 617-991-7300

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Quantity _____ Peripheral Requirements _____

USM is a world-wide 400 million dollar designer and manufacturer of systems aimed at improving the productivity of manufacturing and service industries.

Products on Show at Spring Joint



Auto-trol's Model 6030 Digital Plotter

6030 Plots on Drum, Draws Straight Lines

ARVADA, Colo. — Auto-trol is introducing a new version of the Model 6030 Digital Plotter featuring an exclusive combination of two plotting surfaces in one machine, both flat bed and drum style.

The company claimed that this is the first drum on the market featuring straight line drawing at any angle at a resolution of .0005 in. with end point X & Y coordinate values as the input command.

Drawing speed is 10 in./sec. The sprocket on the drum is adjustable for varying paper widths from 11 in. to 36 in. wide.

Other features include input from punch cards, paper tape, magnetic tape, and computer interfaces; in-line Nixie-type display of each coordinate instruction, an eight command buffer, all solid state silicon integrated circuit construction, manual entry keyboard, full alphanumeric printer, vacuum hold-down, 8-pen turret, automatic dashed and centerline generation, and a motorized tilt table top. Accuracy of the flat bed is $\pm .004$ in. with plotting areas of 40 in. by 40 in., 40 in. by 60 in. and 60 in. by 60 in.

Prices range from \$35,000 to \$50,000. The 6030 will be displayed in SJCC booths 34005-8.

↑ Mark of Distinction...

DATASCRIBE™... the Vanguard of Data Recorders... provides

- ↑ 250% FASTER COMPUTER THROUGHPUT TIME... enter data directly onto half-inch magnetic tape—end card-to-tape conversion problems.
- ↑ 30% FASTER DATA ENTRY... three DATASCRIBE's easily do the work of four keypunches.
- ↑ IBM 360 COMPATIBILITY... both 7- and 9-track DATASCRIBE's are compatible with third and fourth generation computers.
- ↑ ENGLISH LANGUAGE DISPLAY... data and column number are directly readable; keypunch operator can learn in minutes.
- ↑ DATA INTEGRITY... advanced electronic circuitry ensures reliability of data during all five operating modes: program entry, program verify, data entry, data verify and search.

For full details on DATASCRIBE's features and specifications, contact your Vanguard Data Systems representative.

anguard™
DATA SYSTEMS

1642 KAISER ST./P.O. BOX 1820/IRVINE, CALIF. 92664/PHONE: (714) 540-7640

*ON DISPLAY AT SJCC BOOTHS 5701/2

Memorex Astron Tape Is Coated On Both Sides

SANTA CLARA, Calif. — Memorex Corp. will introduce two new products at the show, a new line of computer tape and a new communications terminal.

The 1240 communications terminals offer a full line of multi-purpose communications terminal equipment.

The Astron computer tape is claimed to be the first tape to be coated on both sides to reduce dirt pickup and scratching during use.

The rear-surface coating is said to prevent crimping on reels and uneven rewinding.

The smoothness of this extra coating is also claimed to significantly improve the smoothness of tape startup and stop during use.

The major direct gain through the new tape is reportedly due to an increase in the coefficient of friction between layers of the tape from 0.25 to over 0.36, thus causing the tape to grip itself more uniformly. The hardness of the rear-surface coating is reported to cause the reduction in scratching that preserves the tape over a longer useful life.

Other products to be exhibited by Memorex include the 630 disk, a 2311-compatible disk drive; the 3660 disk storage system, a 2314-compatible disk system; the 3610 disk storage system, a 1130-compatible disk system; the 620 disk drive, a 360/20-compatible disk drive, and the complete product line built around the company's microfilm printer system.

The microfilm line includes the 1603 microfilm printer, the 1610 film developer, the 1642 viewer, and the 1643 auto-viewer.

Memorex will exhibit in SJCC booth 22000.

Products on Show at Spring Joint

Datamanager Handles Business Data Processing With Hardware Instructions

ST. PAUL, Minn. — The 501 Datamanager will process business-oriented data handling such as reports generation, data editing, and basic file processing through a set of built-in micro-instructions rather than through complex user-written programs, according to the developer, Atron Corp.

The 501 combines the detailed operations in such instructions

as MOVE ITEM, or LEFT JUSTIFY into single machine instructions, the company claimed.

The Datamanager is available with low- or high-speed card readers, low- or high-speed printers, magnetic tapes, fixed-head disks, and a line of communications equipment, the company said.

The system without peripherals sells for under \$6,000 in OEM quantity, and for higher prices depending on configuration, to

the direct end-user.

All data is handled as variable-length strings internally, the company said. Editing operations, field manipulation, record manipulation, and basic functions for report generation are present in the hardware, allowing users to make full use of the machine's memory for program development with minimal software overhead, Atron said.

Atron will exhibit in SJCC booths 43010-11.



The Atron 501 Datamanager

Series 400 CRT Terminals Show Alpha, Graphics

CAMBRIDGE, Mass. — Computek, Inc. will be displaying its Series 400 CRT displays, graphic input devices, and the Model 100 CRT terminal at this year's SJCC.

The 400 is an alphanumeric character and vector graphic storage-tube display. Models within the Series 400 include the 400/10 for vector graphics only, the 400/12 for alphanumeric characters only, and the 400/15, which offers both. The 400/20 adds curve graphics to the existing vector capability of the 400/10.

With the use of curve graphics and cursive character generation, special symbols are generated clearly, the company said. Graphic control comes from a set of buttons (up, down, left, right, and home). Optionally, the computer can locate the cursor and it can be controlled through a joystick or a graphic tablet.

The optional graphic tablet, Model GT/50, offers both 8-bit and 10-bit resolution. The sensing field is electromagnetic, rather than electronic, reducing the cost of the GT/50, the company said.

The Model 100 display terminal can be programmed through the microprogramming that uses a refresh-tube CRT display. The miniprocessor can store data and control peripheral devices such as tape cassettes or hard-copy printers. The minicomputer's memory is a delay line.

Computek will exhibit in SJCC booth 10005.

NCR Exhibit To Show Century 200 Computer

DAYTON, Ohio — NCR is exhibiting one of its Century 200 data processing systems. NCR also intends to show the new Ultrafiche system, and the microcard fiche storage system. A special thermal-activated printer will also be on display at the company's SJCC booths 52013-17.

Datum Has Everything Under Control

Adding tape to today's most popular small- and medium-size computers is simple. Buy a Datum 5091 Magnetic Tape System and plug it in.

The 5091 has an IBM-compatible seven and nine-channel format and includes read-after-write parity check, generates VRC, LRC and CRC, and checks VRC and LRC. It's compatible with your computer's magnetic tape software. Available with up to four tape transports, it will read/write at 10-, 20-, or 30-thousand characters/second.

It comes with interconnecting cables, connectors, computer interface cards, and a software package that includes input/output subroutines, a comprehensive diagnostic routine and a maintenance routine.

For information about a Datum 5091 for any of the computers listed below, write or phone DATUM, INC., 170 East Liberty Avenue, Anaheim, California 92801. Phone Number 714/879-3070. TWX Number (910) 592-1289.

A Datum 5091 is available for any of the following computers:

HP2114	IBM 1130	Honeywell 124A
HP2115	PDP-9	Honeywell 316
HP2116	PDP-9/L	Honeywell 516
PDP-8	PDP-15	XDS CE16
PDP-8/L	Varian 620i	XDS CF16
PDP-8/i	CAI 816	Micro-Systems 810

 datum inc.



Products on Show at Spring Joint

Wang 700A Calculator Can Execute 960-Step Program

TEWKSBURY, Mass. — Wang Laboratories will demonstrate its desk-top calculator system and a new plotter and alphanumeric output writer for its calculators.

The calculator, the 700A programmable calculator, is actually a minicomputer with numerical readout displays and cassette program storage.

The system has up to 120 storage registers and can accept up to a 960-step program, according to the company.

Each of the 120 data registers can add, subtract, multiply, and divide. With a price of \$4,900, the unit is competitive with many small minicomputers now available.

Numbers can be up to 12 digits, with a two-digit exponent (ranging from +99 to -99). The built-in memory has a 8,192-bit core. Programs may be built in the core memory, and then transferred to the built-in cassette tape drive for permanent storage.

A plug interface is provided for an IBM Selectric typewriter. Special function keys, of which there are 55, include sin, cosin, tangent, arccosin, arctangent, hyperbolic sin, hyperbolic cosin, hyperbolic tangent, and hyperbolic arcsin, arccos, and arctangent.

Other functions include polar coordinate conversion, and rectangular coordinate conversion.

Special functions, such as mean and variance calculation, standard deviation, and calculations peculiar to any type of engineering are available as substitutes at no extra cost, the company said.

The calculator offers 300- μ sec add times, 3-msec floating-point multiply, 3.5-msec divide, and 15-msec $\log_e X$ and

$\log_{10} X$. Trigonometric functions require 250 msec each.

The unit, using the comparison and array storage functions, can invert an 8 by 8 matrix, according to Wang.

The company is also showing its Model 702 plotting output writer for both digital and alphanumeric output from Wang's 700B and 720B programmable calculators. Graphic accuracy is within 0.01 in. The printer/plotter sells for \$3,500.

Wang Laboratories will exhibit in SJCC booth 40000.



700A Programmable Calculator

Read-Only Memory Stores 388K Bits, Cycles in 200 nsec

SUDBURY, Mass. — Memory Technology, Inc. will unveil new high-capacity read-only memory systems at the SJCC. The new memory features up to 393,000 bits of storage accessible in 200 nsec.

The new systems pack up to 49,152 bits on a single 12.9 in. by 10.4 in. printed circuit board — double the capacity of former systems, while retaining high speed (200 nsec access time), and low power (0.1 milliwatt/bit).

John J. Marino, company president, cited new computer-controlled production "braid" weaving looms that string several hundred wires at a time as a key factor in the development, along with greater packing density of MSI electronics and improved drive circuitry.

The MSBS read-only memory line now includes models with capacities of 128 to 1024 48-bit words and 256 to 2048 24-bit words on a single board. Larger, multiple-board capacities are supplied in a 19 in. relay enclosure and offer up to 98,304 bits on two boards (formerly required four), up to 393,216 bits on eight boards. All at 500 nsec full cycle time; 200 nsec access time. All with less than five watts of power per 49,152 bits. The increased storage density has resulted in a 35% increase in system reliability.

Memory Technology Inc. will exhibit in SJCC booths 2113-14.

Make your own mini computer

You can build your own mini computer, or you can buy from us. There is no other way to give your system a perfect fit. True, the market has plenty of mini computers. Most are good and have features which seem ideal for a given system. But there is always something wrong. You settle for what is wrong to get what is right. Compromise becomes the rule, not the exception.

We developed the Micro 800 Series to eliminate compromise. Everything is there to choose from. Yet you pay for and receive only what you need. First we saved you money by stripping away all but the essential hardware needed for a dedicated application. Then we gave you versatility by coming up with two unique mini computer features—modularity and microprogramming.

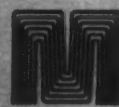
Modularity lets you expand or reduce the core memory from 0 to 32,768 bytes and the ROS from 256 to 1024 words simply by plugging in boards. You can even add five interface boards to the main chassis. Through microprogramming, you can literally design your own proprietary computer. You can define your own instructions, input/output and interrupt capabilities.

A complete software system guides you from flow-charts to symbolic assembly, through interactive simulation to a read only memory map.

Just mount the required diodes on a printed circuit board and plug it in. You've optimized a computer for your particular application. That could be anywhere from a hardwired controller to a complete software programmable, macro level, general purpose computer.

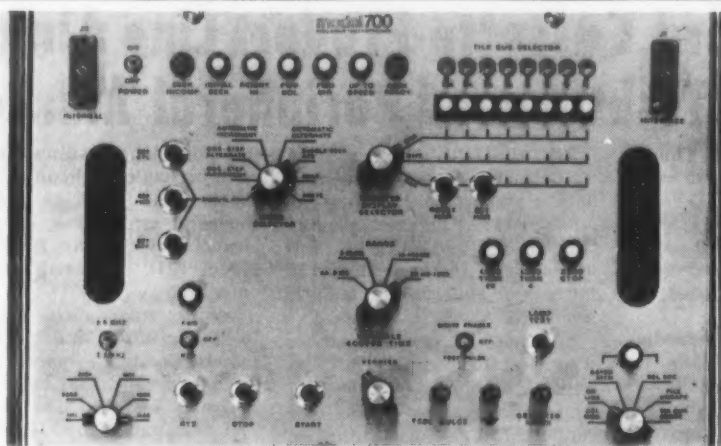
Take advantage of the fact that Micro 800 commands are read out of ROS every 220 nanoseconds, permitting execution of up to 4.5 million operations a second. Or that I/O interface and processor oriented functions can be put into firmware to increase performance, minimize hardware, and significantly reduce costs. Develop your own benefits. Be as creative as you like because there is a lot to work with.

If you are in the market for a mini computer, start with the irresistible Micro 800 Series. Discounted prices begin at \$2720. Write for details and our application note, "Introduction to Microprogramming." Micro Systems, 644 E. Young Street, Santa Ana, California 92705. Telephone (714) 540-6730.



Micro Systems
A Microdata Subsidiary

Products on Show at Spring Joint



PGI Model 700 Disk Drive Test Exerciser

716 Disk Storage System Compatible With IBM 2311

CHERRY HILL, N.J. — A disk storage system in the \$20,000 range will be introduced at the SJCC by Peripherals General, Inc.

The new system, the 816/716 disk storage system, is designed to provide a storage facility that can interface directly with the central processor of small to medium computers. It is also intended for use in special storage systems, and reductions in price are available with large quantity orders.

The 816/716 system uses 2311-compatible removable disks and has a maximum capacity of 116 million bits.

The unit consists of a controller (Model 816) and one or two disk drives (Models 716) which interface with the controller.

The Model 816 is a 16-bit unit capable of handling up to two disk drives. The Model 716 disk drive uses the 1316 disk pack and is plug-for-plug compatible with the 2311, according to the company. It employs a hydraulic head positioning mechanism and features a built-in maintenance panel.

Initial deliveries of the system are scheduled for Spring 1970.

A disk drive exerciser, the Model 700, will also be introduced.

The new instrument is intended for use with the IBM 2311, the PGI 711 and compatible disk storage drives. It is also intended for certain other disk drives which use the 2316 type disk pack.

The Model 700 permits the user to localize disk storage drive malfunctions without suspending data processing, the company said.

The major area of application is field service, but the instrument can also be readily used in production and engineering laboratories.

The Model 700 will allow a complete logic and control check of a disk storage drive off-line. It can also be used on-line to monitor a unit performing under normal operating conditions. The 700 disk drive exerciser can generate six different data patterns in the Write Mode, allowing oscilloscope wave shape monitoring of any disk storage track.

The Peripherals General SJCC booths are 10012-13.



PGI 816/716 Disk Storage System

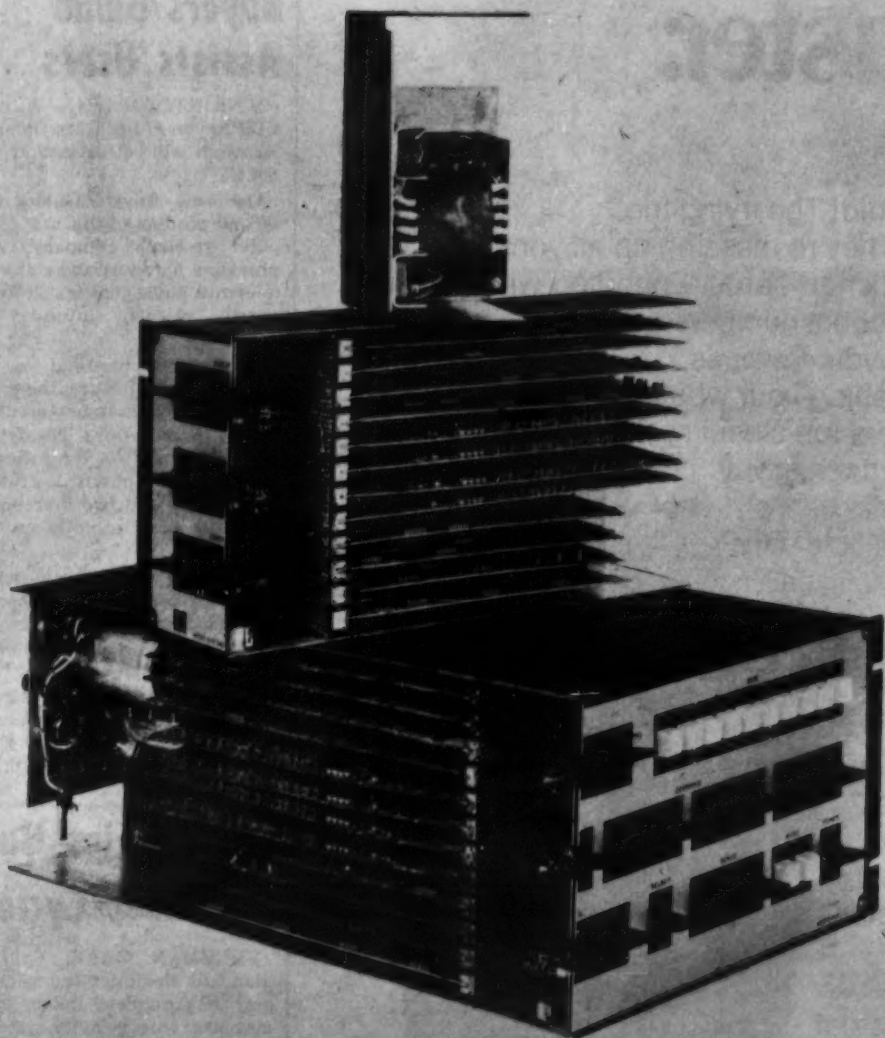
N/C Unit PDP-8-Compatible

REDONDO BEACH, Calif. — United Computing Corp. has developed an APT numerical control (N/C) processor system which can be loaded and processed without modification by the Digital Equipment Corp.'s PDP-8, according to the firm.

The system, called Uniapt, is said to reduce to approximately \$40,000 the price of the computing system required to run the APT program.

The Uniapt system handles all part programming functions for numerical control tools up to, but not including, five-axis. It provides the capabilities needed to accomplish both two- and three-dimensional part contouring.

er. Use our parts.



Products on Show at Spring Joint



Data Rite 5000

Compu Cord Cassette Product Line Aimed At Mini, 'Tight' Speed Peripheral Market

WALTHAM, Mass. — CompuCord Inc. will unveil its entire product line at the SJCC.

The basic product line is aimed at the minicomputer and peripheral equipment market designed for tight control of speed and high packing density.

CompuCord will also introduce its Data Rite 5000, low-cost keyboard to CRT terminal with cassette storage capacity.

The company's basic product line is built around the Model

1100, the first industrial-grade cassette-loaded digital magnetic tape transport. A bit-by-bit incremental battery operated model (1100 DC) with low power drain that can be used in portable applications is also available.

Two models, the Computette 1200 and the Computette 1210, utilize the basic tape transport and provide electronics. The Model 1200 is a cassette loaded incremental/continuous tape

transport that features unique error-correction circuitry that enables the units to provide single bit error correction on a character-by-character basis. The Model 1210 is a serial data-oriented unit.

Another unit in the CompuCord line is the Model 1400, a cassette system comprised of three interdependent tape decks designed for end user market and is compatible to minicomputers in sorting and compiling operations among others.

The cassette tape transport provides data storage, programming and data retrieval capability and replaces punched paper tape equipment in areas such as inventory control systems, accounting devices, process control equipment, oceanographic and airborne applications where high density storage and high speed read/write capability is required.

CompuCord will exhibit in SJCC booth 10005.

Wave bye-bye to Phoebe Phumblefingers, Holly Holepuncher, & Suzy Spacewaster.



Behold! The trying trio.

They're messing up all your punched cards. Encoding wrong account numbers on your invoices. Pushing your whole operation clear into the hallway.

Maybe it's

time for a new deal. And we've just the expert little card handler to turn the trick. We call it the DRC-700. It's a unique, easy-to-use OCR device that automatically reads and MICR encodes 4,000 credit card invoices an hour without computer control. It can also eliminate human error. Process even badly smudged invoices. Directly replace 8 manual operators and their encoders. And it lets you cut processing costs right from the start.

Why not go modern? Wave bye-bye to the girls. Begin a whole new card game with our new off-line OCR unit. Winner take all... For details, call or write: Data Recognition Corporation, 908 Industrial Ave., Palo Alto, Calif. 94303. Phone (415) 326-4810.



DATA RECOGNITION CORPORATION

Datapro's EDP Buyers Guide Assists Users

JENKINTOWN, Pa. — A new EDP Buyers Guide from Datapro Research will be featured at the SJCC.

The new Buyers Guide, the second product of this new computer research company, will provide a hardware and software reference guide that is said to be totally oriented towards the users.

Information provided is intended to give the user the needed data for decisions, rather than simply investigations. The data is broken into five categories — suppliers, computers, software, peripherals, and feature reports, like that done recently on the System/3.

The initial volume is a looseleaf notebook containing 120 reports published to date. Monthly update supplements are published on new developments.

The basic price for the service is \$190/year, with discounts available on multiple subscriptions. Datapro Research will exhibit in SJCC booth 5703.

Ecom Series Has 900-nsec Cycle

SHERMAN OAKS, Calif. — Standard Memories, Inc. will display its complete Ecom series magnetic core memory systems. Particular emphasis will be placed on the Ecom series B, with a 900 nsec cycle time and the Ecom series D, a 2 μ sec unit.

An "instant formal quotation" will be printed upon the request of any qualified user, the company said.

Standard Memories SJCC booth is 50016.



Mass memory and Massive memory
the cost cutters

Our Large Core Store offers mass memory in 20 million bit building blocks. Access is 1.1 microseconds. Bit cost is cut to about 1.5 cents. Only Data Products' unique core technology makes it possible. The other innovation, our Large Disc Store, gives you massive memory: two billion bits at a time and compacted into 13 square feet of floor space. A voice coil servo-positioner provides 55ms average access. LDS is sale priced under \$60K in OEM quantities to celebrate a decade of disc file leadership. (Our Systems Division will interface either LCS or LDS for users) Ask Bob Englert what our memories are made of (213) 981-9600. See us at booth #1000, SJCC.

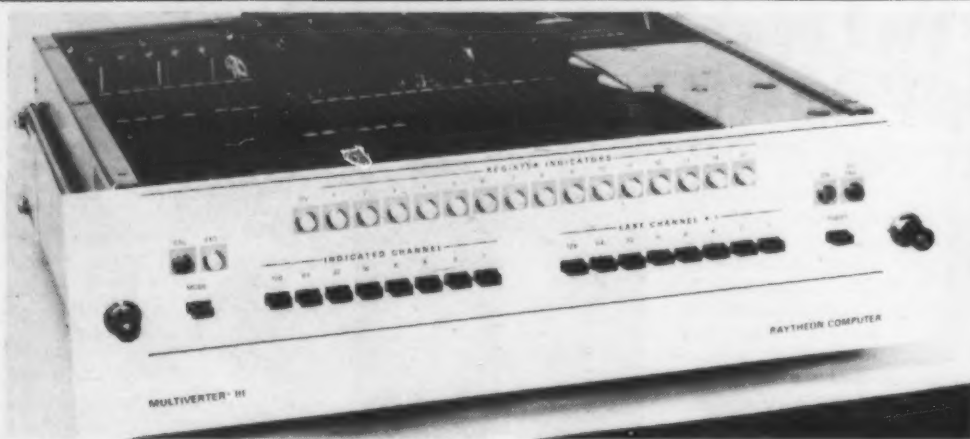


DATA PRODUCTS

OEM marketing 16055 Ventura Blvd., Suite 419, Encino, Calif. 91316.

Los Angeles 213/981-9600 Minneapolis 612/927-8747 Dallas 214/239-9641 Acton, Mass. 617/263-3961 Bethesda, Md. 301/652-8120
Melbourne, Fla. 305/723-0720 Chicago 312/325-6630 Amsterdam, The Netherlands 020/156-297 London, England 01-579-2917
Cherry Hill, N.J. 609/667-7555 Los Altos, Calif. 415/941-5485

Products on Show at Spring Joint



Raytheon Multiverter III

Raytheon Multiverter III Does Hybrid Conversion

LEXINGTON, Mass. — Raytheon Co. is planning to introduce the Multiverter III as an addition to its line of analog/digital converters at this year's SJCC.

Manufactured by the company's computer operation, the new converter, designated Model MADC15, will operate at a throughput rate of 100 KHz with 15-bit resolution.

System accuracy of the unit is 0.02% plus or minus one half the

least significant bit. It includes a 50 nsec aperture time sample and hold amplifier that settles within 2.5 μ sec after a 20V step input. The amplifier also presents a 100 megohm input impedance.

The standard analog input range of plus or minus 10V is converted to an output code of 2's complement. All input-output logic levels are DTL and TTL compatible. Multiplexing of the analog input channels can be performed in sequential, random, or frame scan modes.

The MADC15 is available in many configurations. The maximum configuration includes the analog-to-digital converter, a high performance sample and hold amplifier, up to 64 channels of analog multiplexing, and control logic for ease of interface.

Mechanically, the unit is available in a connector block assembly or mounted in a 19-in. Retma case.

Prices start at \$4,095 for an 8-channel instrument. Delivery is 90 days from receipt of order. The Multiverter III will be part of the company's exhibit in booths 5500 and 5600.

RJE Terminal Costs \$29,400

EDEN PRAIRIE, Minn. — Tec, Inc. has announced the availability of a new remote job entry terminal (Rjet). The Tec 520-40 Rjet provides another choice for computer users who are planning, or now have, remote access multi-programming software to materially improve CPU usage.

Tec's new 520-40 automatically reads an 80-column card deck, submits it to a CPU for compilation/execution, and prints the output on a standard 132-column line printer in desired format. The operator need only load the cards and push "GO."

In computer installations, the Tec 520-40 Rjet offers improved and more efficient use of the CPU. The price of \$29,400 includes a 400 card/min reader, a 300 line/min printer with 132 columns, an operator control panel, a synchronous or asynchronous serial communication interface and the programmed controller complete with cables and installation.

The peripherals are all field-proven and can, if desired, be purchased separately. The controller software provides versatility and expandability as well as the ability to "individualize" the terminal to either the operating system or the terminal operator, the company said. A program is now available to simulate the 2780 terminal. Others are in development.

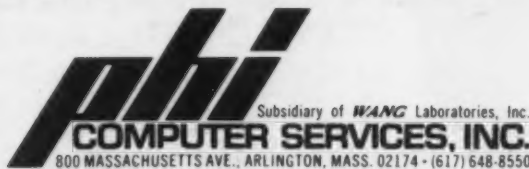
This equipment will be in operation in SJBB booths 4704-06.



Detail from "Floating Shapes" by Willy Baumeister

the changing state-of-the-art

United with change, creativity is a unique thought process, unrestrained by old ideas. But successful creation requires much more than just new ideas. It also requires the ability to translate abstract thought into practical solutions. That ability is founded on diversified experience, the finest tools, and a complete knowledge of all aspects of the field. In computers, that knowledge is constantly being changed. Yesterday's understanding is today's handicap. Not at PHI. As an industry leader, we're helping to mold tomorrow's state-of-the-art. For over a decade we have been creating many of the most sophisticated applications in computer technology. Tomorrow's application is at PHI... it could be for you.



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Secretary and Minicomputer Perform Warehousing Chores With Robert Crane

FREDERICK, Md. — A secretary and a minicomputer can perform the material handling and paperwork for the warehousing system developed by Aerojet-General's Industrial Systems Division.

The material handling system employs a Varian 620/i minicomputer to control a "robot warehouseman," which can lift palletized 3,000 lb loads atop 60-foot-tall storage racks, and to prepare printed transaction details for inventory control and invoicing. Incoming shipments of palletized materials are positioned on the receiving dock parallel to the stacker crane's trackway.

Working from the shipments' lading bills, the secretary in the computer control office feeds descriptive information into the computer via teletypewriter.

From this point on, the computer takes command.

The computer can instruct the crane to store only, retrieve only, store and retrieve, move a load from one storage location to another, or any combination of the above in one command, according to Varian Data Machines.

The stacker crane travels through the warehouse at 300 ft/min. The lifting mechanism travels vertically at 75 ft/min, while the lifting arms reach into

the storage racks at 40 ft/min to store or retrieve 3,000 lb loads.

Computer control of the stacker crane utilizes horizontal and vertical address encoders to obtain X and Y coordinate data, horizontal and vertical tachometers to obtain velocity data, and platform detectors to obtain Z coordinate data in crane positioning.

Features of the stacker crane control system effect rapid, positive, and simple control, either

automatic or semiautomatic. These systems incorporate Varian 620/i computers to maintain a record of in and out transactions.

This data can be transmitted on-line to a central data processing facility (or off-line at customer option) for inventory control, invoicing, etc.

Aerojet-General Corp., P.O. Box 460 here, quotes delivery at about nine to 24 months. Price varies with each installation.



Aerojet-General's warehousing system is automated so that a secretary and a minicomputer perform all material handling and paperwork.

DEC PDP-10 Aids Quick Nuclear Data Analysis

UPTON, N.Y. — The installation of a time-sharing computer at the National Neutron Cross Section Center will allow researchers and engineers studying nuclear energy and building reactors to have quicker analysis of their experimental data and quicker access to a massive data base.

The center was established at the Brookhaven National Laboratory (BNL) here in 1967 as an outgrowth of activities beginning in 1951. It is a facility for collecting, analyzing, storing and disseminating nuclear experimental data created at government and private laboratories throughout the world.

Requests for information average about 50 each month, and the data handling operation is extensive. The experimental neutron library, which contains data on nuclear experiments, presently exceeds one million data entries, which are continually updated.

The center will use a Digital Equipment Corp. PDP-10 to process incoming data, submit it to analysis, and store the analyzed information.

In addition to research conducted at Brookhaven, the center coordinates the data evaluation function for approximately 20 major research centers, including Livermore, Argonne, AEC/Oak Ridge, and labs of several private corporations.

WHO WAS MOTHER GOOSE?

There was an old lady who lived in a house on Washington Street in Boston. Elizabeth Goose. And for the better part of her 92 years until 1757, she entertained her sixteen children with simple little fantasies, or nursery rhymes.

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DRUM AND DISK MEMORIES - CONTROLLERS



Lie detector test study at Delta College is being aided by an IBM 360/40. Use of the computer allows more accurate analysis of critical factors in determining deception by a polygraph test subject.

Computers Analyze Lie Detector Test Accuracy

UNIVERSITY CENTER, Mich. — Lie detector tests may be made more accurate because of computer-based research at Delta College here.

Prof. William Yankee, academic dean of the college and a nationally known polygraph expert, is using a computer to analyze factors he feels are critical in determining deception by a polygraph test subject.

His project is based on the belief that changes in heart rate, pulse amplitude, blood pressure, breathing patterns and the skin's resistance to electricity can be evaluated and measured on the computer.

"Polygraph test results now only are as reliable as the operator of the machine," Yankee said.

"We hope to develop formulas to cut errors in human evaluation. We believe combining or isolating the factors with which we wish to deal will reduce the margin for error."

Yankee's research, begun while he was

on the faculty at Western Michigan University, involves polygraph experiments with student subjects. Those taking the test commit a mock crime, such as the theft of money from a desk drawer. Then they submit to the lie detector.

Examiners ask a series of controlled questions, and a student responds negatively to each. In this manner, when a veiled question concerning the crime is posed, a lie will result.

Following the student polygraph tests, results from an accompanying graph are converted to numerical values. The polygraph chart is broken into question zones, or specific reaction areas, into which each question falls.

Numbers also are assigned each activity on the chart. The resulting data is transferred to work sheets and punched into cards for computer processing.

An IBM 360/40 correlates each question zone with every other zone, and comes up with an index for each zone. Research-

ers interpret the printout data to determine the zone in which the deception took place.

"Our current research takes advantage of the computer's ability to mathematically manipulate hand-quantified data having to do with deception criteria," Yankee said.

"Soon, we hope to begin testing out the reliability and validity of the criteria as interpreted in our present tests. This should permit us to draw very definite conclusions regarding the value of the polygraph to business and law enforcement agencies."

Northwest Paper Co. Controls Deliveries With Computer Help

CLOQUET, Minn. — Quick response to customer orders, better control and next-day delivery of paper are three of the major benefits The Northwest Paper Company derives from a new computer-based system.

Using CRTs linked to their computer, Northwest officials can confirm an order and the details of its delivery within seconds for customers hundreds of miles away.

Terrence White, Information Systems manager, said: "A Minneapolis customer, for example, can call a local number and talk with one of our sales representatives here over a special line."

"Our representative finds out what the customer needs, types into the IBM 360 questions about what's in stock, reserves it for that customer and begins making



A new IBM system is helping Northwest Paper Co. improve its own efficiency while increasing the speed of response to customer orders.

shipping arrangements which will have that paper at the customer's place of business the next morning."

How It Works

To be as responsive and accurate as possible, Northwest has stored in the computer details on its entire paper and paper products inventory, prices, shipping requirements, and records of previous transactions.

The same system used to display data for telephoned orders also is used for mailed orders.

A clerk opens the mail and uses one of four IBM 2260 visual display units to determine if the necessary stocks of paper are available. Checking the video display to see if Northwest can ship it immediately, the clerk schedules the order. The computer then updates stock records and triggers paperwork necessary to acknowledge the order, bill the customer, and update management records.

The same order entry system is used to accept those items which need to go through the manufacturing process, providing customer acknowledgment, paperwork for internal control, invoicing, and the facility to handle mixed stock and manufacturing item orders.

"A telephone inquiry and response took up to an hour. Now, one takes five minutes or less," White reported.

LET'S TALK TERMINALS



Confused by so many terminals and so many claims? ALPHACOM has an answer that will make your choice easier—the new DW-33 video terminal with features other low-priced units can't match:

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The DW-33 video teletypewriter is ideal for time sharing and small computer input/output. There are many other features and a low price that really is low... under \$3,000.00 in quantity. And that's something to talk about.

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A USUAL THING HAPPENED WITH A PDP-10 THE OTHER DAY

Status of WESTDEC PDP-10 at 14:52:55 on 29-Jan-78

Uptime 18:35:06, 64% Null time = Idle+Lost = 58% + 6%

Job	Who	Where	What	Size	State
1	1,1	DET	SYSST	1K	+C SW
2	101,133	TTY2	PIP	4K	TT SW
3	101,120	TTY74	MONIT1	30K	RN SWF
4	200,206	TTY66	PIP	4K	TT SW
5	101,112	TTY96	LOGIN	1K	+C SW
6	101,121	TTY46	COMPUT	30K	+C SW
7	101,102	TTY3	BASIC	3K	TT SW
8	101,116	TTY8	BASIC	1K	TT SW
9	101,114	TTY14	BASIC	3K	+C SW
10	101,151	DET	SYSTAT	2K	+C SW
11	101,163	TTY71	MONIT1	3K	RN SW
12	1,2	CTY	SYSTAT	2K	TT SW
13	101,137	TTY6	BASIC	20K	TT SWF
14	101,112	TTY75	COMPUT	30K	RN SW
15	101,160	TTY70	COMPUT	2K	RN SW
16	101,150	TTY57	TEACH	15K	TT SW
17	101,176	TTY54	FPROP3	30K	TT SW
18	101,101	TTY61	BASIC	20K	TT SWF
19	200,207	DET	SYSST	2K	RN
20	101,172	TTY31	MACRO	1K	TT SW
21	101,140	TTY55	FPROP1	30K	RN SW
22	101,130	TTY62	BASIC	20K	TT SW
23	101,127	TTY1	FORT1	6K	+C SW
24	101,112	TTY4	FPROP3	30K	TT SWF
25	101,162	TTY42	LINED	2K	TT SW
26	1,1	TTY51	LOGIN	1K	TT
27	101,151	TTY60	FPROP3	30K	RN SW
28	101,176	TTY52	FPROP3	30K	+C SW
29	101,143	TTY63	BASIC	20K	TT SWF
30	101,116	TTY7	BASIC	3K	+C SW
31	101,112	TTY73	SDIO	3K	RN SW
33	101,110	TTY13	BASIC	3K	TT
34	101,112	TTY5	RDIO	3K	HQ
35	101,104	TTY36	BASIC	3K	TT SW
36	101,126	TTY32	FORT1	6K	TT SW
37	101,131	TTY33	FORT1	2K	TT
38	101,121	TTY11	COMPI1	2K	+C SW
39	101,120	TTY72	FPROP3	30K	TT SWF
40	101,105	TTY37	LOADER	2K	TT SW
41	101,122	TTY30	FORT1	9K	TT SW
42	101,111	TTY44	DDT	3K	+C SW
43	101,151	DET	SYSTAT	2K	+C SW
44	101,124	TTY40	BASIC	20K	TT SWF
45	101,151	TTY67	SYSTAT	2K	TT
46	101,103	TTY34	BASIC	3K	TT SW
47	101,113	TTY41	BASIC	20K	TT SW
48	101,157	TTY50	SDIO	1K	+C SW
49	101,151	TTY65	FPROP3	30K	+C SWF
50	101,132	TTY53	F40	1K	HQ
51	101,132	TTY35	F40	1K	IO
52	200,205	TTY10	COBOL	13K	TT SW
53	200,207	TTY43	AID	1K	+C SW
54	101,151	DET	F40	5K	TT SW
55	101,151	TTY77	F40	5K	TT SW

56	101,147	TTY25	FPROP3	30K	RN SW
57	101,112	TTY64	SDIO	3K	RN SW
58	101,106	TTY22	BASIC	1K	TT SW
59	101,117	TTY23	BASIC	20K	TT SW
60	101,115	TTY20	BASIC	3K	RN SW
61	101,146	TTY26	SYSTAT	2K	+C SW
62	101,144	TTY24	FPROP2	30K	+C SW
63	101,141	TTY27	FPROP1	30K	TT SWF

High Segments

Program Owner	High K	Users
LOGIN	1,1	1K 2
COMPI1	1,1	2K SW 1
MACRO	1,1	5K SW 1
LOADER	1,1	2K SW 1
F40	1,1	9K 4
BASIC	1,1	5K 16

Dormant Segments

Program Owner	High K
LOGOUT	1,1 1K SW
TECO	1,1 2K SW

% Swapping space used = 733/888 = 92%
% Virt. Core used = 745/798 = 93%
Swapping Ratio = 745/74 = 10.1

%Virt. Core saved by sharing = 103/(103+745) = 12%

Busy devices:

Device	Job	Why
PTR	30	AS
LPT	19	INIT
DTA0	49	AS
DTA1	12	AS

PRINTOUT FROM LINE PRINTER SHOWING SYSTEM STATUS OF 63 USERS ON PDP-10

Working multi-programming monitor. XDS hasn't done that.
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Computer to Run Pennsylvania Melt Shop Operation

BEAVER FALLS, Pa. — A computer-controlled melt shop operation is scheduled for startup next August at The Babcock & Wilcox Co.'s Tubular Products division plant here.

Going on line will be a Bailey 855 computer control system to handle power demand control, operator practice guide, and direct lines of communication between the lab and furnaces and furnaces and computer.

Combining both power demand control and practice guide into one computer system has been hampered until now by the difference between these two functions. Power demand control is an on-line, real-time, continuous function, while practice guide is a melter-oriented function performed on a random basis.

Perfecting a single system with the flexibility needed has proven to be impractical with only software memory protection.

In this case, a program error made

during a change in the practice guide function can disrupt the entire system, causing the loss of power demand control. This cannot be tolerated since a large portion of the savings achieved are the result of power demand control.

The system has as one of its features eight independent functional computers operating with hard-wired fences which prevent a program error in one function from carrying over to another function.

In the 855 system, power demand control, communications, and practice guide, each are assigned their own functional computer area, and essentially each is independent from any other function.

Human Communication

The accuracy of computer results depends on the prompt and accurate entry of system variables into the computer. To facilitate this human communication function, three types of panels will be supplied — chem lab panel, furnace panel,

and melter's panel with tape reader.

The chem lab panel permits the operator to enter bath analysis, heat number, and test identification. The results of spectrographic analysis of the steel will be printed at the proper furnace after it is manually entered into the lab panel.

Each of five furnace panels permit entering 100 different inputs, such as scrap weights, flux weights, ferro-alloy weights, and delay information. These data concerning each heat will be accepted by the computer and printed at the furnaces as it is entered by the operator. This information will be stored in the computer and then printed on the heat sheet printer in the computer room after the heat is tapped.

The melter's panel will permit entry of data for each heat using punched paper tape. Data on heats that have been made will be available through the heat sheet printer and punched paper tape for EDP use.

The computer will be able to store data for 15 heats. This allows for three heats per furnace to be stored within the computer.

Practice Guides

Practice guide includes the functions and calculations necessary to print instructions for the furnace operator to produce a heat of steel consistent with good furnace practice. The practice guide functions include: melt down guide, estimated tap time and carbon-oxidation control calculations, furnace and ladle addition calculations.

The practice guide will interrogate the steel grade data to determine: slagging data, bath temperature requirements, standard material additions to the bath, time requirements for preliminary chemistry tests, and rheostat and tap settings.

Computer Project Controls Effects At Planetarium

ROCHESTER, N.Y. — Providing the general public with an enjoyable and meaningful "total experience" at the Strassenburgh Planetarium's Star Theatre is the goal of the second phase of a computer project being undertaken jointly by the Rochester Museum and Science Center and Yondata Corporation.

Presently, a Digital Equipment Corporation PDP-8 computer controls only "special effects," those auxiliary projection facilities utilizing lighting and sound. These include up to 300 projectors of different sizes and types located around the periphery of the planetarium's 65-ft dome, numerous light banks, and three tape decks included in the sound system.

The computer also controls a double series of 12 custom-built panoramic projectors with cross-fade capability that can be used to simulate a limitless variety of horizon scenes.

The second phase of the project will permit the computer to control all of the movements of the giant-size Zeiss Model 6 Planetarium Projector, including the raising and lowering of its elevator.

The project will be completed by July, 1970, when all technical components of the theatre will be controlled by the computer. Thus, Rochester's Planetarium becomes the world's first totally automated "Star Theatre."

According to Ian C. McLennan, executive director of the Rochester Museum and Science Center, "Our policy is to design a total system for automated programs to standardize, refine, and repeat our shows perfectly. The computer system eliminates the possibility of human error that is always present in manually operated, live showings."

By utilizing a computer, difficult routines can be repeated perfectly time after time. For example, if during a manually operated show there is a sequence where a rocket travels to the moon, the lecturer would have to perform several dozen different and distinct movements of the controls within a few seconds.

The complete routine would be impossible for a man to do, so in the past the routine was compromised. But, with the aid of a computer, this formerly impossible routine can be performed. In fact, the computer in the planetarium could easily complete up to 500 such moves within the same period of time if called upon to do so.



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information stored in a central data base. With automatic data exchange between system elements. So the outputs of marketing can become the inputs of production. And both can feed the planners in finance. Integration also prevents things like going in two directions at once. The people in engineering won't be trying to save a few pennies on design when market research says quality is more important than price.

As for our delivery system. Well, all we've got is a low cost, general purpose I/O terminal combining full batch and time sharing capability. Which means total information reach. Everywhere you have our terminal you have remote batch

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Some 1,600 loaves are baked and eaten daily at the Central State Hospital, which is using an IBM computer for menu planning.

Hospital Plans Menus With Computer

MILLEDGEVILLE, Ga. — Central State Hospital has one of the largest centralized food service operations in the world. Every day it feeds 9,600 patients, 300 inmates of the adjacent women's prison, and 1,000 employees of the two institutions.

Despite rapidly rising basic food prices, the large mental health hospital expects to reduce previously projected food costs by \$150,000 this year.

This one application alone justifies the yearly costs of the computer, an IBM 360/30. In addition, the system may be used for many other important applications that allow the hospital to better care for patients and use available resources efficiently.

"We have made menu planning a more exact science than was ever before possible here," said Maurice E. McNabb, food service administrator at the state mental institution.

"There has been no change in the 600

basic food items or 360 recipes used here," he explained. "They are all in computer memory now, instead of in books and on lists which had to be consulted manually. We have also calculated and stored within the computer a price-per-pound breakdown of every food item we stock, as well as its nutrient value.

"In the past, we relied on judgment in trying to plan three well-balanced meals at an average daily cost of \$8,250. And it was always a staggering task, when you consider that our dietitians were making up menus for some 10,000 people a day, including more than 5,000 special diet meals.

"Now the computer enables us to produce comparable meals at about \$7,750 a day. It's a simple matter of being able to control our food costs and nutritional requirements more accurately than in the past."

The computer began turning out menu

plans at the beginning of this year.

It previously took a dietitian an average of two days to plan a week's meals. Now dietitian Regian Sandlin simply enters the food categories desired for each meal and the computer searches through its food lists and menus, measures possible meals against nutrient values and cost constraints and prints out a day's menu in about five minutes.

Every menu meets or exceeds the average daily nutrient values recommended by the Food and Nutrition Board of the National Research Foundation.

The cost efficiency was also made possible in part by reducing the number of extra, or "safety margin", meals prepared each day. In the past, an estimated 2,000 extra meals per day were made up to allow for fluctuations in population. But that number has now been shaved by 80 per cent as the result of computer projections based on a ward-by-ward daily census taken over the last three months.

Lessening the number of safety margin meals has also cut down on the time and effort required for preparation and cleanup, helping to relieve a shortage of personnel. It also has decreased the amount of time spent by top food service executives in reviewing menu schedules.

"We are now able to do more things with the available work force," McNabb said.

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Electric Bills Optically Read By N.J. Light

MORRISTOWN, N.J. — A machine that can read hand-printed numbers is helping to speed up and insure greater accuracy in the processing of 540,000 electric service bills for Jersey Central Power & Light Co.-New Jersey Power & Light Co.

An IBM optical reader recently installed by the electric companies reads 25,000 bills daily and feeds the information to a computer for automatic processing. Soon the IBM equipment will take on the additional task of scanning some 600,000 monthly meter readings.

Customers will continue to make payments in person or by mail as before. When the payment is received, a cashier first checks to see that the amount paid is the same as the amount on the bill. If not, she pencils in the actual amount paid in a special space on the bill.

When the 1287 machine scans the forms, it first "looks" to see if a figure is penciled in, and if so, transmits that amount to an IBM 360/30. Otherwise, it reads the printed amount.

Later, the 1287 reader will feed data from meter reading documents directly into the computer which will update customer account records and print bills. The computer will even calculate estimated consumption in cases where no meter reading has been obtained.

The optical reader employs a flying spot of light five thousandths of an inch in diameter to read machine-printed or hand-printed numbers. The spot is projected by a light beam through an optical sensing unit. When the spot crosses any part of a number it spirals completely around the number in a technique known as curve following before moving on to the next number. Electronic circuits in the 1287 interpret the values of the numbers traced and transmit them to the computer.

In the future, Jersey Central and New Jersey Power & Light Companies expect to use the 1287 to help process payrolls, material inventories and for other applications.

Computers Cut Research Project Time, Budget in Half

By Christine Magnuson
CW Staff Writer

MADISON, Wis. — A research project at the University of Wisconsin indicates that the computer has tremendous potential for use in the humanities.

For 10 years Professor Menahem Mansoor has been conducting the project "Politics and Diplomacy in the Arab World — A Documentary, Chronological, and Biographical Study." Mansoor, chairman of Wisconsin's department of Hebrew and Semitic studies, reported that "without the computers, it would have taken 20 more years to complete the work and doubled the required budget and staff."

The results of the study will be eighteen volumes, to be published in June 1970. The volumes will contain a chronological entry for every important diplomatic or political event occurring in the Middle East between 1950 and 1967 and a computerized index.

Eventually, this project will comprise 40 to 50 volumes, all containing indexes. These volumes will cover earlier times, identifying and indicating the locations of significant Arab world documents. Books

of biographical information on persons mentioned in the documents and chronology will also be included.

The completed computerized index will list and cross list 120,000 events, 35,000 documents, and 18,000 individuals. Mansoor explained that the Wisconsin study attempts "to supply the scholar with all the source material he needs and let him spend all his time studying and evaluating."

Eventually the project information will be processed by computers, indexed, and made available in microfiche form at the U.S. Office of Education Eric System, and, possibly, at the Library of Congress.

The program, which is written in Fortran Bibcon (Bibliography and Concordance), extracts unimportant words such as articles from the cards and alphabetically lists the important words. The result is an index of all the key words from the collected data.

Bibcon runs on Wisconsin's Control

Data Corp. 3600 system. Dr. Richard Venesky, of the computer science department, developed Bibcon from CDC's Kwic (Key Word in Context) program.

By the early or mid-1970s, the completed work should consist of a catalogued and computerized history of the Middle East, 1900-1967.

With this study, diplomats, scholars, statesmen, and anyone else seeking information on the Arab world may find source materials previously inaccessible because of distance and language.

Professor Venesky has been the consultant on the computer procedures for the project. Students at the University of Wisconsin have assisted Prof. Mansoor in gathering and compiling data.

The Institute of International Studies, U.S. Office of Education, provided the main support for the research. Other funding agencies are the External Research Program, U.S. State Department; Office of Scientific Research, U.S. Air

Force; and the Graduate School and College of Letters and Science, University of Wisconsin.

Mansoor calls the project "a scholarly project in the humanities." He stresses the fact that the project "is not a political undertaking, despite its title." Researchers have encountered no difficulty in obtaining access to documents held in Middle Eastern nations, Mansoor continued.

"We are getting support from all sides, the Arab countries and Israel," Mansoor noted. "We feel this [project] will be a contribution toward understanding and peace in the Middle East."

Professor Mansoor has been chairman of Wisconsin's department of Hebrew and Semitic studies since its inception on the Madison campus in 1955. He also teaches and conducts research in both modern and ancient languages of the Middle East. He was among the scholars chosen to translate the Dead Sea Scrolls.

Radio-TV Station Computerizes Sales, Traffic

MINNEAPOLIS, Minn. — After four years of extensive research, Kool Radio-Television, Phoenix, Ariz., has computerized its sales, traffic, and accounting departments.

The station is using a computerized radio/television traffic accounting system offered by Broadcast Computer Services (BCS) of Colorado Springs, Colo., through Control Data Corporation's Cybernet service.

Using only a minimum of input from the customer, the BCS system requires no in-house equipment, although Kool Radio/Television has installed a sophisticated computer terminal to access CDC's 6600 in the firm's Los Angeles data center.

The computer program is designed so that specially tailored forms are filled out by the broadcast station's traffic manager on receipt of a sales order. Cash receipts and deviations from original order are the only other inputs needed.

Computerization of broadcasting information has been tried many times by many stations; however, Milt Smith, supervisor of Kool's Computer Division observes that the Phoenix station's attempt has been completely successful.

"The daily television log is produced in 45 seconds; the spot availabilities, printed daily and sent to national sales representatives, are produced in 45 seconds," Smith said.

The Kool terminal is also available for public use at a nominal charge. This service puts the computer at the disposal of any business in Phoenix that needs fast turnaround. The Kool computer terminal is equipped to send and receive information including printouts.

If extreme "security" is important, an outside user may bring his own operator to perform tape-to-print operations and receive printed listings of the transmitted 6600 output.

Or, since the processing results are initially received on magnetic tape, he can take the tape to his own printer in another location. Thus, with input on punched cards and output on tape, all computer information is strictly private.

Currently the BCS system is installed on computer systems at Minneapolis, Los Angeles, Palo Alto, and Washington, D.C.

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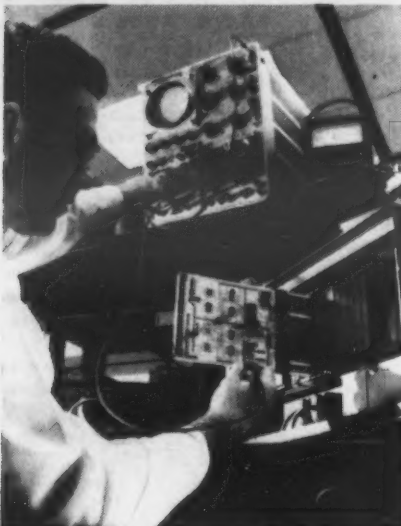
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DATA AUTOMATION SERVICES, INC.



Bell Labs engineer tests a logic circuit in the data communications terminal, part of an experimental system for reading gas, water or electric meters automatically over telephone lines.

Computer Reads Gas Meter Over Phone

HOLMDEL, N.J. — A computer could read your electric, water, or gas meter automatically through your telephone line without ringing the phone or perceptibly tying up the line.

To test such a system, trials involving up to 150 homes here have been started by Bell Telephone Laboratories. More extensive trials will be held in other locations during 1970.

Automatic meter reading requires some special equipment in the home, telephone central office, and utility company office.

Whether new equipment and techniques will permit this to be done on a broad scale with sufficient economy is being studied by Bell Labs in cooperation with Bell System phone companies, public utilities, and meter manufacturers. AT&T is coordinating the trials and studying economic factors involved.

Establish Connection

To use the system, an attendant at the

utility company establishes a connection between its computer and special equipment in the telephone company central office. The computer calls the subscriber's phone number, and telephone equipment connects the call to the meter on the subscriber's telephone line.

To keep the phone from ringing, this connection is made using different electrical currents and circuits than those normally used. An encoder and a modulator attached to the meter convert mechanical dial readings into electrical pulses or tones which are transmitted, through a coupler and telephone lines, back to the utility's information collection center.

There a data communications terminal, which controls the entire process, receives the meter signals and directs them to the computer. The utility's data processor then handles the information for record and billing purposes.

The full procedure, from connection to

recording, takes only a few seconds. The part of the process involving the subscriber's line is even faster. The automatic system will not interrupt a regular call already in progress.

In such a meter reading system, the Bell System would provide the communications connections to and within the telephone network. The utility companies would be responsible for providing the terminal equipment — the computer or recording unit at one end and the meter and certain attachments at the other.

Equipment required at the home, in addition to the meter itself, includes: an encoder to convert mechanical dial readings into electrical form; a modulator or modem to translate electrical pulses into a series of tones suitable for transmission; and a coupler to connect the modulator to telephone lines.

Encoding would be a function of utility company equipment. Modulation could be handled by utility company equipment or by a telephone company data set. The coupler, supplied by the phone company, could be either part of the data set or a separate unit if the utility company provides the modulation equipment.

The trials will show how each piece of experimental equipment works in a complete system, and indicate any necessary design change. Whether or not public utilities ever use such a system will depend upon their view of the economic feasibility of the system, and of other factors.

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System Stocks Drugs, Helps Pharmacists

PITTSBURGH, Pa. — A system for stocking more than 1,000 drugs and intravenous solutions is helping pharmacists and doctors improve patient care at Shadyside Hospital here.

Shadyside, a 373-bed private institution, uses an IBM 360 to order, stock and track drugs more efficiently, and to assure their availability at all times.

Shadyside is one of the first hospitals in Pennsylvania to employ such a system. Officials said it saves up to 80 man-hours in the hospital pharmacy each month.

Much of this saving is realized in computer-printing of lengthy drug purchase orders containing names like succinylcholine chloride and chloramphenicol palmitate.

Albert Gerlach, chief pharmacist, said the additional free time allows pharmacists to devote themselves more to purely professional duties, such as keeping abreast of new products and developments in the field.

"It also frees the pharmacist to work more closely with doctors," he added. "This is invaluable to the specialist, who needs to be aware of the latest trends in his area to better care for his patients."

Under the computerized system, cards are punched for each drug or intravenous solution (IV) in stock. As drugs go into use, the cards are placed in an "activity drawer." When a drug is reordered, the in-use cards are sent to the computer room where a printout is produced on the computer.

After Gerlach approves the printout, the computer automatically prepares a six-part purchase order for each drug.

The new system also anticipates drug usage in various categories; helps protect against shortages of drugs or IV's; and, in case of unprecedented or heavy usage of a particular drug, provides for automatic reorder.

May 6, 1970

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Early Delivery Pays Off

DEC technicians watch as diagnostic programs are run through the PDP-11, recently delivered ahead of schedule at its Maynard, Mass. plant. The earlier-than-planned production move has enabled delivery schedules to be modified. "Not only are we able to deliver twice as many PDP-11s initially, but we are also able to offer earlier deliveries of larger systems," said a company spokesman.

Columnist Foresees Data Bank Use in Marketing

By Harvey Elman
CW Staff Writer

MILWAUKEE — Marketing in the year 2000 will be a highly developed, fast-paced, telecomputerized battle of giants, in which marketers will be able to use a "national, centralized data bank" containing a dossier on every American to reach the precise consumers they want, according to a columnist for the Women's Wear Daily, a New York fashion trade newspaper.

In a recent speech before more than 200 supervisors and teachers at a regional Conference for Distributive Education here, Samuel Feinberg said that when "we can't cope with the questions of the 20th century... we skip over them and choose to talk about the 21st century."

His conclusion sounded a warning about "the present dilemma of race, space, and pollution in the cities."

In between, Feinberg painted the picture of a country with a population of 245 million to 300 million people in 2000, with 85% living in three urban centers: from the East Coast to the lower Great Lakes region, the California region, and the Florida region.

People Paramount

"For marketing men as well as social scientists, nothing is more important than people," he said, "their number, where, and how

they live."

More people, he noted, will be living in the megalopolises and shopping in areas set up for the convenience of hurried customers.

While Feinberg said he "could only flounder in forecasting what the GNP will be for 1970," he did say the gross national product would be "well beyond the \$2 trillion point in 2000."

This affluence, he said, will make today's luxury items tomorrow's necessities.

The columnist gave examples of shopping by television and telephone in a cashless, checkless society in which orders, bills, and shipments are controlled by a central computer.

"Theoretically," he said, "any store in the world could be brought within easy dialing reach."

The move toward bigness is likely to continue, he said. "A battle among a limited number of giants, notably in banking and retailing, is shaping up for large shares of the consumer's total requirements covering every need of a normal lifetime."

But, he said, "there will always be room for the little merchant, whose saving graces are agility and flexibility, an ability to move freely and quickly, to make immediate decisions and act upon them right away to meet customers' demands faster than can his ponderous bigtime rivals."

University Computing Co. Forms New System Support Division

DALLAS — University Computing Co., (UCC) has formed a new division committed solely to offering comprehensive computer maintenance service, reported company President Charles J. Wyly Jr.

The new organization, designated UCC System Support Division, (SSD), will service all makes of computer equipment, with emphasis on IBM's 360 and mixed configurations.

Wyly pointed out that computer service is not new to UCC. The nucleus of the new division comprises three UCC service organizations, one with more than 14 years of experience.

Headquartered in Los Angeles, the new division is currently staffed with 225 engineers, technicians, and support personnel.

The president of the System Support Division is Edward F. Kearns, formerly a vice president with Computer Sciences Corp., where he was responsible for the Computer Sciences Institute and the Application Systems Division.

The new division is presently maintaining such installations as CDC 1604, Univac 1107, 1108, 1104 and 418 and PDP 8, 9 and 10 for a variety of users.

Maintenance Savings

The System Support Division will offer cost savings in maintenance of purchased computer systems as well as total responsibility for maintenance of mixed configurations, whether

purchased or leased.

Wyly reported that many computer users have machines of different manufacture which interface and communicate with one another.

"Users of these mixed configurations often encounter confusion and frustration about who to call for service or which company has the responsibility and resources to complete the repair. SSD will relieve the user of these anxieties because of total responsibility and will be able to afford the greatest saving in both time and money to the user. The customer will maintain his business, and SSD will maintain his computing systems," he said.

The new division is presently staffed to design and build special interfaces for product applications. There is a variety of

good peripheral equipment on the market that many times cannot be interfaced with a specific computer, and the computer manufacturer often does not provide such an interface.

SSD also expects to expand to its system reconditioning and reconfiguration facility in Dallas.

New Division Flexible

Wyly emphasized that although the new division will stress hardware maintenance and special engineering, it will also provide software and communications support, through-put analysis, and in some cases, computer operation service.

"The new division," said Wyly, "is flexible enough to customer design system maintenance to meet the individual customer's needs."

MIT Countersuit Seeks To Restrain Fabri-Tek

CAMBRIDGE, Mass. — MIT has filed a countersuit against Fabri-Tek, which had called the school's licensing policy for the Forrester patent "unreasonable" [CW, April 29].

Fabri-Tek charges MIT with attempted discrimination and restraint of trade and asks the court to determine the fairness of MIT's pricing policy for its patent on ferrite cores.

MIT also seeks a court order requiring Fabri-Tek to execute the license, or an injunction against "further unlicensed use," an MIT lawyer said.

The attorney also said that the

license was awarded to users who could "make or have made" the ferrite cores. He said he assumed that most of Fabri-Tek's business was with licensed users.

The injunction would require Fabri-Tek to assure that all its business is with licensees if the company chose not to acquire a license.

"Fabri-Tek is seeking a license at rates used when IBM bought its license in 1963. The whole industry has changed, and those rates would probably be considered too low now," the MIT lawyer said.

Computer Center Opened in Rio

NITEROI, Brazil — To accentuate its plans for progress in the 1970s, Rio de Janeiro has opened one of the most modern computer centers in South America here.

A Univac 9400 and three Univac 9300 systems — valued at approximately \$1.5 million and supplied by the Univac Division of Sperry Rand do Brazil — are installed in the center, the largest in Brazil.

The computers are being used by a number of state government departments including the secretariats of administration, finance and education, the highways department, the Central Electric Power Authority and the State Development Authority.

Typical of their uses are banking applications for the State Bank of Rio de Janeiro, processing of property, school and turnover taxes for the state administration, and payroll preparation for all of the state employees. The State of Rio de Janeiro has approximately five million persons.

Rio de Janeiro expects shortly to install remote terminals in other cities in the state to link local administrative offices with the central computer center in Niteroi.



One Call Will Reserve a Car

Inaugurating the new Hertz Rent-a-Car and International Reservations IBM 360 system in Chicago are Donna Roach, Hertz Chicago reservations supervisor, and Barbara Francis, assistant reservations manager for International Reservations. Travelers are now able to reserve any Hertz rental car worldwide by making one toll-free call from anywhere in the country. Hertz automobiles may now also be reserved by 3,000 hotel and motel properties for their guests through the system.

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Bull-GE Shows 2 Multicomputer Network Systems

HANOVER, Germany - Two multicomputer network systems, one linked with six European cities, were recently demonstrated for the first time by Bull General Electric Co. in an exhibit at the 1970 Hanover Fair.

The exhibit featured a GE-53 small-scale information system, and a GE-120, small to medium-scale system - both linked to a large-scale, GE-600 computer system in Paris. In the second network, illustrating the company's time-sharing services, an array of terminal, input-output communication devices enabled Fair visitors to "talk with" computers in Cologne, The Hague, London, and Frankfurt.

The idea behind the huge network exhibition, said GE spokesmen, was to demonstrate the superiority and value of information produced by DP systems which integrate a whole complex of business operations.

Bull-GE also displayed the three-dimensional power of the Gecos III (comprehensive operating supervisor) that makes possible local and remote batch processing, remote access processing, and time-sharing simultaneously in the GE-600 system.



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Trade Shorts

Northwestern Univ., Evanston, Ill., has been awarded a \$1.5 million grant to establish an Urban Systems Engineering Center in its Technological Institute and related development in the Computer Center.

Castel & Cooke Inc., Honolulu, has formed a new corporation — C&C Computer Systems — to handle the computer time-sharing and other computer services acquired from EDP Central Inc., Portland.

Headquarters of the new corporation will be in Portland, Ore.

Scott Paper Co., Philadelphia, has purchased an approximate one-third interest in Industry Computing Systems, Inc., a newly organized company which will provide computer facilities management to other companies. No purchase price was revealed.

Industry Computing Systems will provide complete data processing services to customers in the \$5,000 to \$50,000 per month equipment rental category.

Three patents involved with errorless functioning of tapes on modern systems were awarded to IBM, Poughkeepsie, N.Y. The patents relate to Cyclic Redundancy Checking (CRC), which is used by most computer tape drives for reportedly near fool-proof detection of tape errors. David T. Brown and Frederick F. Sellers Jr. of IBM's Poughkeepsie lab filed the patents.

Corning Glass Works, Corning, N.Y., has formed a Data Systems Dept. to be based in Raleigh, N.C., and which will develop and market the Corning 904, an interactive graphics display system for time-sharing users.

Fairchild Camera and Instrument Corp., Mountain View, Calif., and Hewlett-Packard Corp., Palo Alto, Calif., have entered into a patent cross-licensing agreement covering various aspects of semiconductor manufacturing technology.

Terms permit HP to utilize Fairchild's basic Planar process and integrated circuit patents involving the design and fabrication of semiconductor devices. Fairchild is allowed to manufacture semiconductor products patented by HP.

Fairchild also announced delivery of the first commercially available large LSI memory system to Burroughs Corp. A processor element memory (PEM) will be used in the Iliac IV being built for the University of Illinois and funded by the Advanced Research Projects Agency of the Air Force.

Wang Computer Products Inc., Los Angeles, has announced price reductions on its line of magnetic tape drives. Design efficiency has resulted in a more producible product than is normally expected in the manufacture of electromechanical devices, according to Ben Wang, company president.

The new pricing structure,

which became effective April 10, applies to all undelivered equipment. Wang currently manufactures a line of synchronous tape drives which include the Mod 7, 8, and 10.

New operations in England and France are the latest additions to Viatron Computer Systems Corp.'s marketing push in Europe. Twenty-five percent of the Bedford, Mass.-based firm's production is being exported to international customers.

North American Computer Corp. (Nacom), an East Coast

dealer for the new Viatron System 21 terminals and computers, plans to offer these systems independently under lease or rental plans. Nacom is also providing its own financing for customers who plan outright purchase of the low-cost systems, according to Thomas Steele, executive vice-president.

Correction

The price of APT's commercial optical memory [CW, April 1] should read between .001 cent/bit and one cent/bit, not 1 to 10 cent/bit.

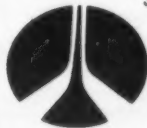
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Contracts

Tri-Data Corp. of Mountain View, Calif., has received a \$600,000 contract to furnish cartridge magnetic tape units to Cascade Computer Systems, Inc., Grand Rapids, Mich.

Mathematical Applications Group, Inc., White Plains, N.Y., has concluded a contract to provide electronic data processing services for the National Federation of Temple Brotherhoods, the organization of 500 reform Judaism men's clubs.

Infoton, Inc. received a contract for 25 of its Vista I cathode ray tube display terminals from the Entriken Computer Co. of Fenton, Mich.

Hazeltine Corp. of Little Neck, N.Y., has received an initial award of \$2.6 million from the Department of Defense for the production of scan converter display systems to be installed in the F-4 Phantom Jet. The value of the multi-year contract is \$7.1 million.

The National Aeronautics and Space Administration's Langley Research Center, Hampton, Virginia, has issued the second yearly renewal of a cost-plus-fee contract to Wyle Laboratories. The contract has been increased by an amount in excess of \$1 million to a contract total of more than \$3 million.

Computer Sciences Corp. has been awarded a \$1.1 million contract by the Defense Communications Agency to provide technical assistance in support of the National Military Command System.

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DRC to Move to Industrial Park

BOSTON — Dynamics Research Corp., a firm active in the Saturn-Apollo program, is moving its headquarters from Stoneham to a 50,000 sq ft, one-story, brick and concrete building now under con-

struction in Wilmington Industrial Park. The construction cost is estimated at \$1.5 million.

Other Expansions

Delta Data Systems has expanded its Cornwells Heights, Pa. manufacturing facility by 10,000 additional sq ft. This brings the total facility of the CRT display terminal and systems manufacturer to 20,000 sq ft. The company address is Woodhaven Industrial Park, Cornwells Hts., Pa.

Building expansions begun by BASF Systems Inc. on Crosby Drive in Bedford, Mass. are valued at \$2.5 million. One building will house a 40,000 sq ft storage and distribution center for magnetic disk packs, computer tape, audio tape, and cassettes. The second building will be used to manufacture plastic reels and cannisters. It will have 30,000 sq ft of manufacturing space.

Expansions

struction in Wilmington Industrial Park. The construction cost is estimated at \$1.5 million.

"We're still expanding, and the consolidation of our entire operation in Wilmington Industrial Park figures to increase our efficiency a great deal," said Dynamics Research Senior Vice-President Alan L. Friedman. "We'll be just 60 feet away from our other 32,000 sq ft plant," he added.

Moving into the new building will be the company's components and metrigraphics divisions.

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in Computer Memory Systems

with Royco
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tection system

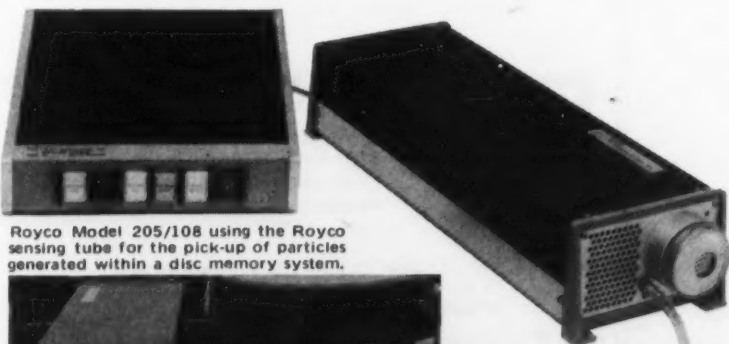
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The 205/108 head crash monitor measures particle concentration. In the case of excess concentration, which means that a system malfunction is in progress, a visual and/or audio alarm indicates that immediate corrective action is necessary. The ROYCO 205/108 can automatically retract the heads. To prevent data loss. To reduce expensive computer downtime. To save expense of replacing heads and discs. That's positive protection! That's what the ROYCO 205/108 is all about.

Contact us for further information, today. Delivery schedules, purchase and lease rates quoted on request.



Royco Model 205/108 using the Royco sensing tube for the pick-up of particles generated within a disc memory system.

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Order and Installations

IABG, a West German research
 and development organization,
 has ordered a Control Data
 Corp. 6400 system valued at
 \$2.5 million to expand its scien-
 tific and technical services to the
 German aerospace industry and
 government agencies. The sys-
 tem will be applied to the organ-
 ization's work in aircraft design
 and construction, airframe stress
 analysis, flight simulation, and
 aerospace research.

Pharmaceutical Card System,
 Inc. has ordered a GE-415 infor-
 mation system to be installed at
 its national headquarters in
 Phoenix, Ariz. The GE-415 will
 be used to process thousands of
 prescription claims daily while
 performing a variety of business
 and administrative applications.

Eight computerized printing
 management information sys-
 tems (PMIS) have been installed
 by Pica Data Systems, Inc.,
 Princeton Junction, N.J. The
 new installations are at Master-
 craft Lithographers, Davis-
 Delaney-Arrow, Inc., Tauber's
 Bookbindery and United Bind-
 ery, all of New York City; Multi-
 forms, Inc., of Mt. Vernon, N.Y.
 and Fairfax, Va.; Lancer Graphic
 Industry, Inc., Stamford, Conn.;
 Spaulding-Moss, Westwood,
 Mass.; and Metal Edge Indus-
 tries, Barrington, N.J.

Information International has
 delivered a \$229,500 FR-80

computer output microfilmer
 (COM) to Idaho Nuclear Corp.,
 operating contractor at the U.S.
 Atomic Energy Commission's
 National Reactor Testing Station
 in eastern Idaho. The FR-80 unit
 has taken over many of the
 duties of the line printers and
 plotters previously used.

Control Data Corp. of Minnea-
 polis, Minn., is installing elec-
 tronic data processing equip-
 ment at the Air Force Cam-
 bridge Research Laboratories,
 the Electronic Systems Division
 of the Air Force Systems Com-
 mand. The lease and mainten-
 ance cost of the equipment for
 one year is \$1,792,476.

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Union Corp. Forms Electronics Unit

WINDSOR, N.Y. — The Union Corp. has formed the Union Electronics Division. The new division combines the facilities of Burlington Coil, Universal Precision, Inc., and the Components Division of Automation Services, Inc.

The new division offers facilities for production of electronic components and computer sub-assemblies such as prolays, monolays, solenoids, erase heads, solar cells, magnetic pick-ups, actuator assemblies, and Mu metal shields and laminations.

The facilities also include a complete electrical/electronic test laboratory for quality control and final inspection to customer specification. The company is presently engaged in supplying major electronic and computer manufacturers.

Intel Forms Two Divisions For Subsidiary's Activities

SAN FRANCISCO — Intel Corp. has formed two new divisions to conduct the domestic and international activities of Intercontinental Systems, Inc., which

New Subsidiaries

it formally acquired in April.

The new divisions, Intel Information Products Division and Intel International, will be operated as subsidiaries of Intel.

John H. Pickart has joined Intel as president of the Information Products Division. He will be responsible for the division's manufacturing and marketing activities in the U.S., including

word processing, data communications equipment, and off-line systems manufactured at Greeley, Colo. Domestic sales will be made through 20 Intel-owned branches in major cities.

Brooke P. Taylor, former president of Intercontinental Systems, has been appointed president of Intel International. Operations of this new subsidiary will include all the foreign marketing activities formerly conducted by Intercontinental.

Taylor also will be responsible for developing new international operations of the parent company in the future. Intel will have its international headquarters in Monte Carlo, Monaco.

★ Graham Magnetics, manufacturer of high-precision computer tape, has formed a new International Division located in Mamaroneck, N.Y.

The International Division will handle Graham computer tape orders that the company is presently filling for such countries as Sweden, Norway, Italy, Germany, Greece, Austria, Japan, Australia, and the Philippines.

The new International Division will not only sell to these already established Graham markets, but will also help in expanding the company's overseas sales.

★ Ness Industries has formed a new marketing subsidiary, Ness Pacific Inc., which will coordinate the operations of Ness Pacific Ltd., of Hong Kong, and P.T. Ness Industries Indonesia, in Djakarta, both engaged in the assembly of custom and standard electronic components for U.S. manufacturers.

The new subsidiary will market a standard line of high quality pulse transformers and other magnetic components produced at the overseas facilities, in addition to negotiating custom component assembly on a contract basis.

The company will soon announce its first standard products, a series of high quality pulse transformers for computer applications.

★ The Gerber Scientific Instrument Co. of South Windsor, Conn., has formed two wholly owned subsidiaries in Europe.

These subsidiaries, Gerber Scientific, Europe, S.A., located in Brussels, Belgium, and Gerber Scientific, UK Ltd., in London, England, will facilitate handling of the company's growing sales and service activities in Western Europe.

★ Data Packaging Corp. of Cambridge, Mass., manufacturer of products for the data processing, music, and cosmetic industries, has made plans to form a new company, Hellermann Data Packaging Ltd., in association with Bowthorpe Holdings Ltd. of Sussex, England.

The company will manufacture tape reels, containers, and disk packs for the computer industry, and cartridges and cassettes for the tape and recording industries involved in music and education.

The new firm will market its products in 19 European countries and sales operations will be carried out in Sussex at the Hellermann Plastics Division of Bowthorpe Holdings Ltd.

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A typical system costs \$80,000 for a KM-36 system configured to handle 5 low speed and 11 medium speed lines. This price includes the KM-36 processor, a core memory of 16,384 bytes capacity, data set adapters, an IBM 360 interface adapter, associated 360 software, and KM-36 programming. Leases also available.

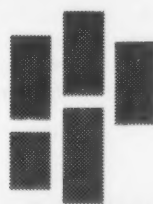
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Fairchild Names Longo Vice-President

MOUNTAIN VIEW, Calif. — Dr. Thomas A. Longo has been elected a vice-president of Fairchild Camera and Instrument Corp.

Longo recently joined the Semiconductor Division of Fairchild Camera as group director of operations, and continues in that post. Prior to joining Fairchild, he was a vice-president and general manager of semiconductor operations of Transatron Electronic Corp.

From 1958 to 1964, he occupied management positions with General Telephone and Electronics Corp., most recently serving as director of research and engineering for the company's semiconductor division, where he was responsible for the development of TTL Integrated Circuits.

Longo received his Ph.D. in semiconductor physics from Purdue University in 1957 where he

Executive Corner

was an assistant professor of physics prior to joining GT&E.

At Fairchild, Longo is responsible for MSI, Hybrid, and other complex digital product operations in the Mountain View and Shiprock, New Mexico, production facilities.

■ Fabri-Tek Co. has named Richard A. Baker vice-president of sales and marketing for the memory products division.

■ Jack Turchon, formerly vice-president and a director of Keymatic Data Systems Corp., has been appointed president of

the firm.

■ Multidata Inc. has appointed Edward J. Willette vice-president.

■ Philip W. Fellows has been elected president of Telex Corp., a wholly owned division of Wellington Computer Systems, Inc.

■ Analytics Inc. of Jenkintown, Pa., has appointed Louis D. Wilson vice-president for commercial and industrial operations.

■ Paul F. Keating has been named a vice-president at Viatron Computer Systems Corp., Bedford, Mass.

■ William H. Rentschler has been elected president and chief executive officer of Photo Magnetic Systems, Inc.

■ Eberhard A. Schwabe has been appointed operations vice-president for Cambridge Memories, Inc., Newton, Mass.

■ Richard E. Shelgren has been named vice-president of Computer Data Systems International Ltd. He will be assigned to the Paris office.

■ William J. Roche has been named vice-president of Computer Investments & Leasing Corp. in charge of banking applications.

■ Thomas E. Duce, former vice-president and senior operations director for Page Communications Engineers, has been elected vice-president of Syntonic Technology, Inc.

■ Robert J. Chernis has joined Austin Systems Co., Inc., as vice-president and director of product planning, while David J. Hayes has been named as vice-president of marketing.

The HETRA T-Series Remote Processing Terminal Systems are the most powerful, flexible, and expandable family of programmable remote terminals available today. We call them the "character crunchers" because they were designed specifically to handle, structure, and manipulate alphanumeric data within communication networks with a

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T-Series Systems begin at \$10,000.00.

We will be demonstrating the T-Series in Atlantic City during the SJCC (May 5-7) "in Booths 6116 and 6117". Come see us. To obtain more information about the T-Series Terminal Systems contact: HETRA, P. O. Box 970, 1151 South Eddie Allen Road, Melbourne, Florida 32901. Telephone: (305) 723-7731.

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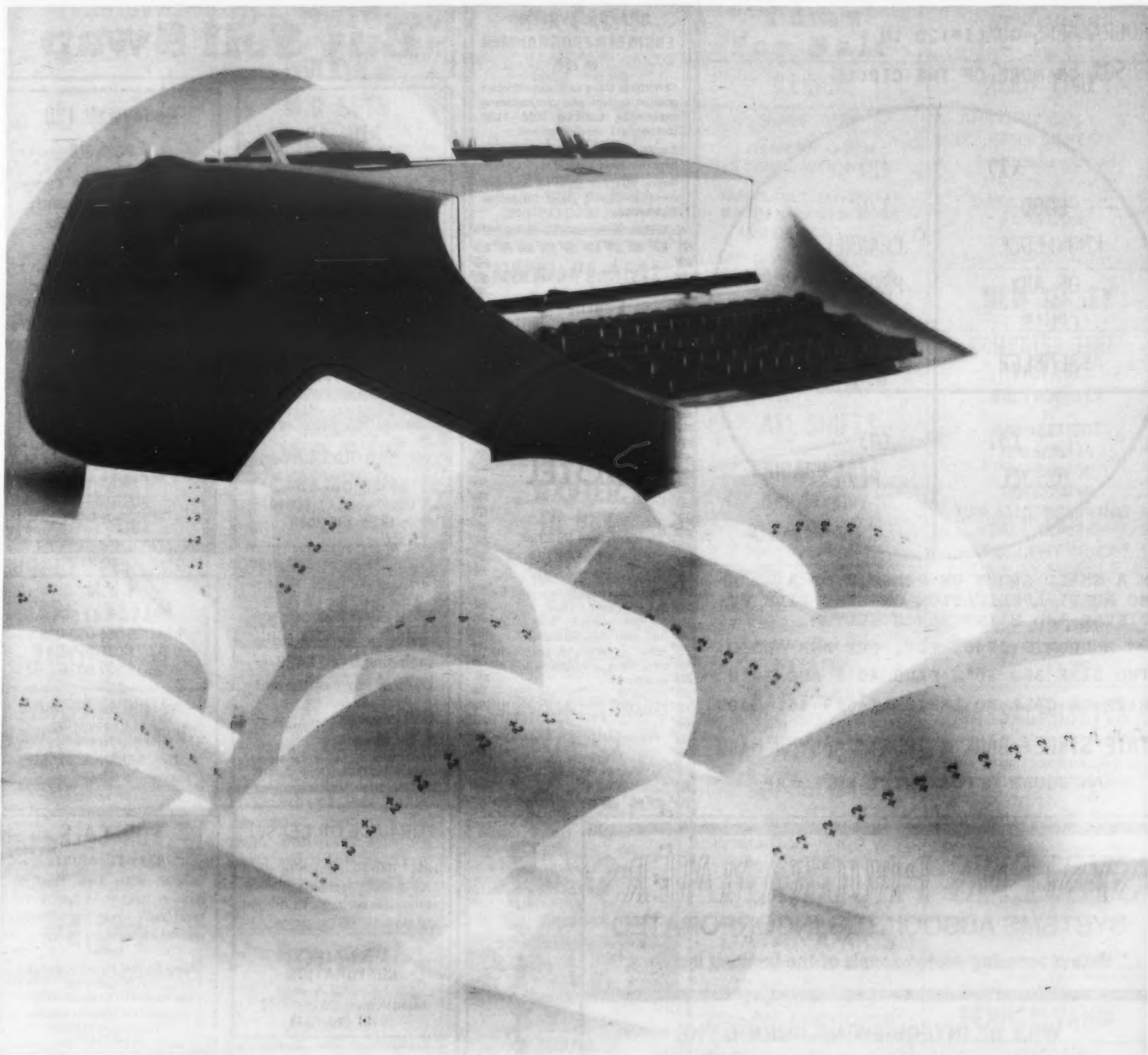
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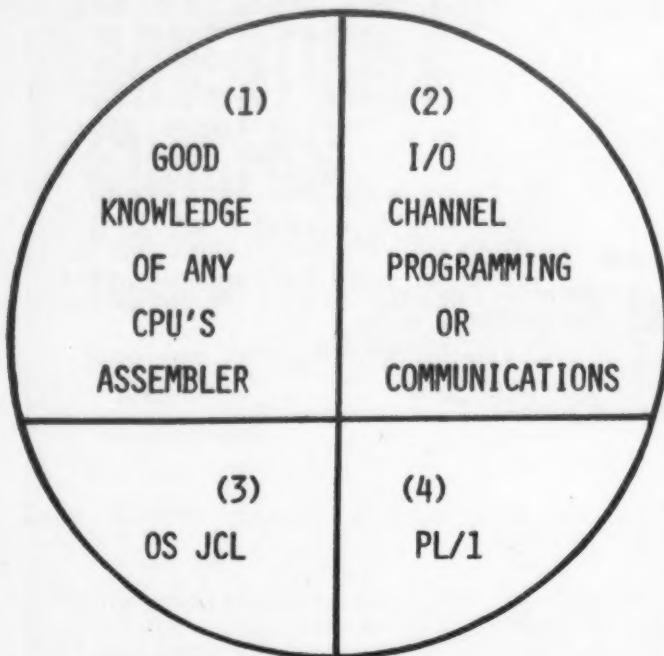
designed terminals. So you don't need phone lines. And because it's your own in-house system, you can use it as much as you want without paying an extra cent for it. It's easy. Our new time-sharing terminal is the first to combine BASIC language programming with an electronic calculator in a single desktop unit. So you can do up to 90% of your time-sharing jobs in BASIC without leaving your desk. And for a lot less than you're paying now. You won't need any more equipment, because the terminal's also

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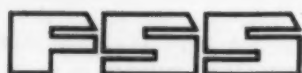
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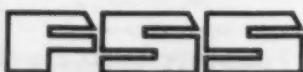
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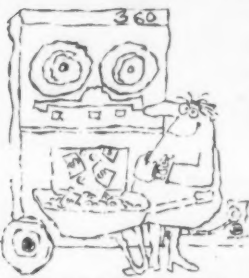
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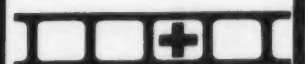
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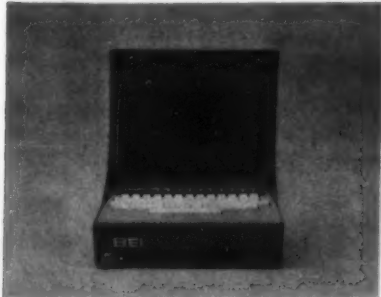
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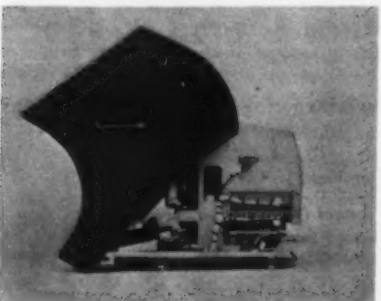
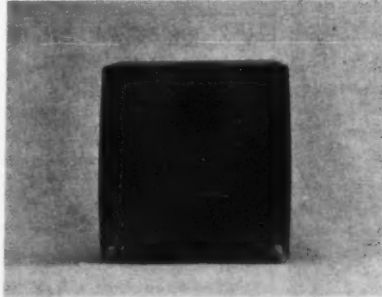
Aside From That

This terminal is smartly functional with a contoured design which will enhance the looks of any modern office. The curved case bottom makes it easy to lift the 30 pound lightweight which is available in green, blue, yellow, brown and buff—plus dozens of special decorator colors.



A Little Back Talk

Shows a clean rear panel which makes this Beehive terminal attractive from any angle. All connectors and the AC power cord are hidden beneath the unit, including a BNC to directly connect low cost, large screen TV monitors. You see, all Beehive CRT terminals are EIA Television compatible.



The Inside Story

Concerns the five modular printed circuit boards, easily reached by lifting the hinged case. Beehive CRT terminals use MOS integrated circuits for both memory and for character generation. The use of MOS results in smaller size, higher speed, lower power consumption and better reliability.



Underneath It All

Are the cleverly concealed controls for On/Off, Brightness, Contrast, System Reset, and a very important Local/Half/Full Duplex switch. This makes it possible to type and edit text under Local control, and then switch to Half Duplex for high speed transmission of the entire message to the computer.



The Closer You Get

The more you'll appreciate the flexibility of Beehive's CRT terminals. Note the Teletype keyboard. Plus the 14 optional black control keys for tabbing, 4-way cursor control, text editing and interface with printers, tape cassettes and, of course, the computer.

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BEI



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May 6, 1970

Page 103



Thomas J. Watson Jr., left, board chairman of IBM, and Mrs. Watson (left-center) examine IBM's new office copier with IBM stockholders Mr. and Mrs. James Garrett at the company's shareholders meeting in Atlanta last week. The copier is the subject of a patent-infringement suit by Xerox.

IBM Foresees Difficult Year, Outright Sales Drop Cited

By Michael Merritt
CW Staff Writer

ATLANTA — Despite the economic slump, IBM's second quarter "is going at about the same rate as the first quarter" when earnings rose 11.8% on a 2.1% increase in revenue, according to IBM Chairman Thomas J. Watson Jr.

Speaking at the IBM annual shareholders meeting, Watson noted that IBM's sales quotas, which were increased by 10% from 1969's, were "substantially" behind schedule. He added that while there has been con-

siderable churning of backlog due to order stretchouts, there have been no production slowdown and no layoffs at IBM.

Saying that 1970 will be a difficult year because of a continued drop in outright sales, Watson also pointed out that rental income, IBM's backbone of profit, continues to rise.

IBM plans to be adding "zero" to pollution in the near future Watson said, noting that this is an easy task for IBM when compared to heavy industry, such as steel or paper manufacturing.

Vietnam Protests

The meeting was marked by several attempts by small shareholders to make the company declare its opposition to the Vietnam war and refuse future Department of Defense contracts until the war is ended.

The majority of the more than 1,000 shareholders at the meeting applauded Watson's defense of IBM's position.

Responding for the company, Watson said that refusing contracts would be a political act, and that "a corporation is not in a position to make political judgments."

Admitting that the profit rate of the Federal Systems Division was considerably lower than those of other parts of the company, Watson noted that he foresees no change in the operations of FSD. He pointed out that among other things a good deal

of basic research valuable to the company is performed by FSD and paid for by the government.

The Federal Systems Division handles about \$250 million of government business, including contracts from the Department of Defense.

Sales Slowdown

The IBM chairman also revealed that sales to leasing companies have fallen drastically, and attributed this drop to leasing companies assuming that the 360 was nearing the end of its product cycle. He refused to comment on the possibility of IBM announcing a new generation of computers in the near future. Industry rumors say that IBM will make such an announcement this summer.

In the meeting, Watson inadvertently said that IBM had announced three office copiers, but quickly corrected himself. In a press conference later, through, he indicated that the company was obviously considering expanding its line of copiers.

Responding to a question from the floor, Watson said IBM had no intention of going into facilities management. He also said that it was too early to tell if separate pricing of systems engineering services would be successful, but he did say that SE services were "on target for their quotas" scaled down for weak economic conditions.

Standard Prudential, L-T Announce Talks On Acquisition Through Exchange of Stock

NEW YORK — Standard Prudential Corp., a diversified financial-services company, may acquire Levin-Townsend Computer Corp.

The computer leasing company has been looking for financial help ever since it became apparent it could not meet payments on an \$11.2 million debt to IBM. At one time Boothe Computer was considering merging with Levin-Townsend, but negotiations were broken off.

Now the current solution seems to be making Levin-Townsend a subsidiary of Standard Prudential, continuing under its present management. The acquisition would be through an exchange of stock.

Announcing the talks, Levin-Townsend President James E. Townsend and Standard Prudential chairman Theodore H. Silbert said they are not yet discussing specific terms.

Silbert said in a telephone interview that he hoped to be "a very harmonizing catalyst" in settling the dispute between Howard S. Levin, deposed head of Levin-Townsend, and Townsend and the company's current

management.

Silbert said: "We are good friends of both factions. I have had a conversation with Mr. Levin, and his attitude is very constructive. I think men of good will can solve these little differences in the scope of the larger benefits available to all shareholders. We are all working toward the same goal — to improve the values and eliminate any factionalism or friction."

Levin has instituted court action to be reinstated as L-T's head and has announced plans for a proxy fight to regain control of the company he founded with Townsend. He currently owns 8% of the company.

L-T said that its recently announced negotiations to sell \$50 million of computer equipment to an unidentified party had been "temporarily suspended" because of the talks with Standard Prudential.

John M. Randolph, president of Randolph Computer Corp., acknowledged that he had had talks with L-T, but refused to confirm that Randolph was the purchaser L-T was referring to. Randolph is the computer-leasing

subsidiary of Travelers Corp.

Standard Prudential owns Standard Financial Corp. and Sterling National Bank, both in New York, as well as other operations.

The officers of the two companies said that before any final plans for merger could be made "an agreement is expected to be reached with IBM to its satisfaction..." concerning L-T's outstanding debt. Silbert said: "We hope to meet with IBM people [this week]."

IBM has given L-T several months to find new financing without pressing for payment of the debt.

CDC Computer Loss Offset by Unit Gains

MINNEAPOLIS — This quarter Control Data Corp. lost \$6.6 million making computers. A year earlier it made \$4.4 million.

CDC was saved from turning in a loss for the quarter, though, by the \$8.3 million profit of its subsidiary, Commercial Credit Corp. Operating net income came out to \$1.7 million, or nine cents a share, down from \$16.6 million, or \$1.13 a share for the same quarter last year.

Commercial Credit's profit rose from \$7.5 million a year earlier.

Earlier this year CDC President William C. Norris had revealed that the company would show a "substantial loss" from computer operations this quarter. Industry sources expect CDC's computer division to remain unprofitable at least through the next quarter.

CDC has attributed the drop in computer profits to government cutbacks and a dismal economic situation. "By coincidence, most of the programs affected by government cutbacks involved our computers," a company official said.

Domestic computer sales have been very weak, as well, although European orders are up. Commenting on domestic orders, the CDC spokesman said: "I've never seen a time in our history when corporations have held back as much as they are

now."

He mentioned postponement recently of one order valued at \$10 million.

CDC has laid off several hundred employees, though the company will not reveal any exact figures. It has also closed several plants.

Projections of earnings for

Commercial Credit range as high as \$36 million for the year, or \$2.50 per share. Last year the finance division earned \$34.8 million, including \$3.5 million of non-recurring items. In 1969, Control Data showed a net operating profit of \$3.19 per share and a consolidated net equal to \$3.62 per share.

Boothe Computer 1st Quarter Ends With 43 Cents per Share Earnings

SAN FRANCISCO — Boothe Computer Corp. has reported first quarter revenues of \$10,222,000 for the period ending March 31, 1970, and earnings of \$727,000, or 43 cents a share. This compares with revenues of \$9,034,000 for the similar period last year and earnings of \$704,000, or 42 cents a share.

Fully diluted, the per share earnings amounted to 39 cents a share for the first quarter of 1970, 38 cents a share for 1969.

D.P. Boothe Jr., chairman of the board, said: "Substantial differences in interest rates between the first quarters of 1970 and 1969 adversely affected our net revenues. During this period, our total debt declined 4.1%, while interest rates increased by 16.4% or approximately 10

cents a share for the quarter.

"The recent drop in the prime interest rate, if continued, will favorably affect revenues for the second and succeeding quarters of 1970."

Boothe Computer is a diversified computer services corporation engaged in leasing, in the worldwide marketing of computer related equipment and in providing software, systems engineering, and equipment brokerage services. The company holds equity positions in 11 different companies which manufacture and market peripheral equipment.

Boothe Computer recently discontinued merger talks with Levin-Townsend Computer Corp., another leasing company. The merged firm would have been the largest in the country.

General Automation Shows Record Sales for 6 Months

SANTA ANA, Calif. — General Automation, Inc. has racked up record sales for the first half of its fiscal year and said it will be operating near the break-even point by the fourth quarter ending July 31.

Lawrence A. Goshorn, president of General Automation, stated that sales for the first half ended Jan. 31 rose to \$2,713,000 from \$622,000 in the comparable period of fiscal 1969. In accordance with the corporate plan, first half operations resulted in a net loss of \$1,060,000. For the same period last year the firm lost \$269,000.

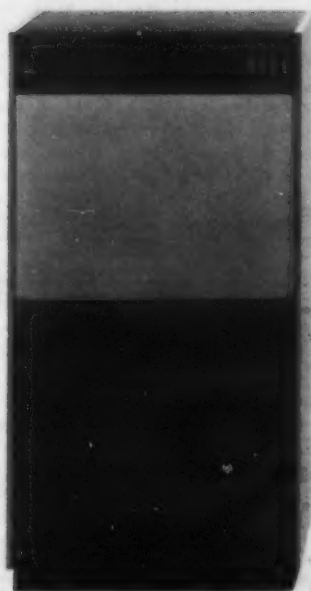
The loss, Goshorn said, "stemmed primarily from an intensification of the company's marketing program in the U.S. and Europe. The marketing program is proving effective, as

evidenced by a substantial increase in the company's backlog.

"The majority of the unfilled orders are from major industrial concerns, many of which are in early stages of implementing their computer-based automation plans."

As of March 31, General Automation had a backlog of \$6,500,000 in unfilled orders, against less than \$1 million in backlog a year earlier.

The six months' results also reflect work on extending the capabilities of the System 18/30, a "supervisor" computer which monitors and controls a number of different production processes, and the SPC-16, a "worker" computer designed for specific tasks, such as directing numerical control machines in production processes.



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If you haven't already evaluated your needs against the 1603 and its low price, you should.

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CDC 3600 Predicts Stocks for Company

NEW YORK — Bench Advisors, Inc., a division of Special Studies, Inc., utilizes a CDC 3600 to determine which stocks of over 2,500 listed on the New York and American Exchanges it should buy or sell.

Dr. Nachman Bench, a Ph.D. in operations research, has developed a computer-based technical analysis system which reviews all the listed securities on both exchanges on a daily basis.

Starting with a data base that contains such information as average daily and weekly vol-

ume, all-time high, one-year high, one-year low, 150-, 75-, 20- and five-day pricing moving averages, 150-, 75-, 20- and five-day price trend, etc. on all listed stocks, the CDC 3600 accomplishes each night what it would take an auditorium full of chartists all day to do.

Twenty-four different simulation models are presently being utilized and they are designed to detect such things as accumulation, distribution, oversold, overvalued, etc., conditions. There are long- and short-term buy and

sell models in order to satisfy any investment objective.

Joseph V. De Pietro, vice-president of the company, stated that "the beauty of it is that the computer is totally unemotional and objective about the market and does not become attached to stocks."

Job Bank Successful

SAN DIEGO, Calif. — San Diego's new job bank, a computerized system of coupling employer and job seeker, helped place 1,300 persons on payrolls since its installation in February.

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Technitrol Buys Honeywell Memory Test Business

PHILADELPHIA — Technitrol, Inc. has purchased from Honeywell, Inc. the memory test equipment business, including manufacturing assets and patent rights, for \$500,000.

Technitrol, which manufactures computer components, systems and related equipment, said its entry into the memory test equipment business is "a natural extension" of existing capabilities.

President E. Stuart Eichert noted that Technitrol's pulse transformer customers are primarily manufacturers of core memories, and that memory test equipment is widely used by these same firms in testing completed core memories as well as their component parts.

The Technitrol official pointed out that the computer industry currently produces more than 20 billion memory cores every year, each of which must be tested individually.

Eichert said that Technitrol will continue the lines purchased from Honeywell, including manufacturing replacement parts, and plans to develop new generations of memory test equipment.

Technitrol also reported that audited 1969 results showed record sales of \$13,180,439, 48% from the \$8,895,736 reported in 1968. For the year total to 40 cents a share, the company had a loss to \$127,293.



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DiComes on Stocks

Market Upturn Imminent, Portfolio to Pay Off Soon

From February to March, housing starts rose 6%, personal income climbed, and industrial production increased (by 0.2%) for the first time in eight months.

The annual rate or price increases speeded up to 5%, slightly more than in the previous quarters, meaning that inflation was as bad as ever.

GNP slid by 1-1/2% to an annual rate of \$727 billion, or the second straight quarter of decline. Purists can declare that

It all points to an upturn so strongly imminent that in the midst of gloom over bargain days in the prices of issues like IBM, Xerox, Digital Equipment, Wang, Burroughs, and nameless others, I must stick to my original premises that six months from now, our model portfolio purchases will not be remiss and will be most profitable for all of us.

The drops in Memorex and IBM, for example, make one think of dollar day prices for seasonal clothing; come the winter, the clothes sold so cheaply in the spring will again command premium prices!

Model Portfolio Review

I was so impressed by the facts I was able to collate for my article on Burroughs last week that I had to do some long serious thinking about my six issues in my \$10,000 model portfolio.

Each stock in the list had virtues working for it and certain detriments against it. Finally, as I hinted two weeks ago, I found Burroughs a stronger situation than Systems Engineering.

Therefore, as of April 27, I have sold Systems Engineering from the account at a price of 25-1/4, which when commissions were included, left me \$1,232.50, or a net loss of \$502.50.

My proceeds (and adding \$54) were then applied to the purchase of 10 shares of Burroughs at 127-1/8, for a net cost of \$1,286.50 (including commissions).

The total value of the portfolio now stands at \$7,943.25, or about 79% of the original investment.

Robert DiComes comments on the stock market for CW from time to time. Educated at Harvard, DiComes is a retired broker who spends his time managing his stock and real estate portfolios, and a farm in New Hampshire.

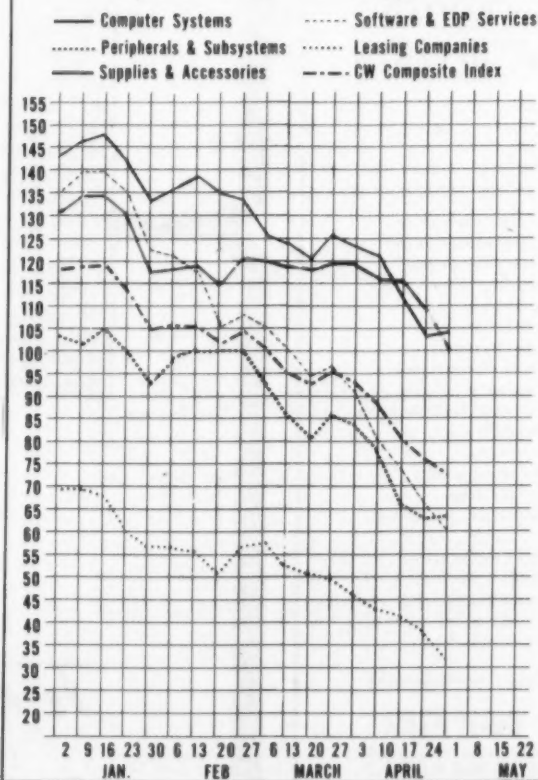
the U.S. is — or was — officially suffering from recession.

Yet most maintain the current period as little more than a "mini-recession." Some areas of the U.S. are enjoying an all-out boom while others are in an alarming slump. Housing construction is still down substantially from a year ago. Jobs are difficult even where unemployment is below the national average of 4.4%. Corporate profits are taking a beating.

Hard to Sell Bonds

There is difficulty in selling bonds in a depressed financial market. Unemployment in the Pacific Northwest is up to 7.4%. Bank humor says we cut rates from 8-1/2% to 8% for money which was unavailable at the higher rate and still unavailable at the lower!

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

In the Supplies and Accessories segment of the Trading Summary, Acme-Visible no longer appears because of its recent acquisition by American Brands.

Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, MAY 1;
OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, APRIL 30

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15-10	11	ADAMS-MILLIS CORP	- 1/4 - 2.22
C	21-15	15	BALTIMORE BUS FORM	- 1 - 6.25
A	25-10	10 1/8	BARRY WRIGHT	- 5/8 - 5.81
A	35-21	23 3/4	DATA DOCUMENTS	+ 1/2 + 2.15
N	19-14	14 3/4	ENNIS BUS. FORMS	- 1/2 - 3.28
N	166-78	79 1/2	MEMOREX	-13 3/4 -14.75
N	114-93	94	3M COMPANY	- 2 - 2.08
O	38-34	34 1/8	MOORE BUS FORMS	- 1 1/8 - 3.19
N	43-27	28	NASHUA CORP.	- 3 - 9.68
O	48-30	31 1/2	REYNOLDS & REYNOLD	- 6 1/2 -17.11
O	30-25	24 3/4	STANDARD REGISTER	- 1 1/2 - 5.71
N	39-28	28 1/2	UARC	- 4 -12.31
A	30-11	13 1/4	WABASH MAGNETICS	+ 1/8 + 0.95
O	41-32	32	WALLACE BUS FORMS	- 6 1/2 -16.88

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62-33	34 1/8	ADDRESSOGRAPH-MULT	- 3/8 - 1.09
O	15-5	5 1/2	ALPHANUMERIC	- 1/4 - 4.35
N	48-21	22	AMPEX CORP	- 1 1/4 - 5.38
A	34-8	10 7/8	ASTRODATA	+ 7/8 + 8.75
O	11-6	6 3/4	ROLY-BERANEK & NEW	- 1/2 - 6.90
N	14-9	9 1/4	BUNKER-RAMO	- 1/2 - 4.88
A	33-18	20 3/8	CALCOMP	+ 3/8 + 1.87
O	13-4	4 1/2	COGNITRONICS	- 1 1/4 -21.74
O	12-7	7 1/2	COLORADO INST.	- 1 1/2 -16.67
O	36-19	17	COMPUTER COMMUN.	- 5 -22.73
A	12-5	5 3/4	COMPUTER EQUIPMENT	- 3/8 - 6.12
A	28-20	22 1/8	COMPUTEST	+ 1/8 + 0.57
A	25-13	14 1/2	DATA PRODUCTS CORP	+ 7/8 + 6.42
O	23-12	13 1/4	DATA TECHNOLOGY	+ 1/4 + 1.92
O	13-7	7 3/4	DIGITRONICS	- 1/4 - 3.12
N	40-17	19 1/8	ELECTRONIC M & M	+ 3/8 + 2.00
O	8-4	4 3/4	FABRI-TEK	+ 1/4 + 5.56
O	17-4	4 3/4	FARRINGTON MFG	+ 3/4 +18.75
O	20-7	9	INFORMATION DIS	- 1/2 - 5.26
A	67-23	26 7/8	MARSHALL INDUSTRIES	+ 1 1/2 + 5.91
A	84-25	30 3/8	MILGO ELECTRONICS	+ 3 5/8 +13.55
N	87-39	41 1/8	MOHAWK DATA SCI.	- 3/8 - 0.90
O	52-21	24	OPTICAL SCANNING	-----
O	17-4	7	PHOTON	- 1 1/4 -15.15
O	11-2	11 3/4	PHOTO-MAGNETIC SYS.	+ 9 1/8 +347.62
A	42-27	31	POTTER INSTRUMENT	+ 1/2 + 1.54
O	25-12	14	PRECISION INST.	-----
O	63-26	30	RECOGNITION EQUIP	- 2 - 6.25
C	34-12	14 1/2	REDCOR CORP.	- 3 1/2 -19.44
N	29-12	13 3/4	SANDERS ASSOCIATES	+ 1 1/2 +12.24
O	53-13	13	SCAN DATA	-----
O	23-11	11 1/2	TALLY CORP.	- 3 -20.69
N	159-82	99 1/2	TELEX	+10 1/4 +11.48
O	50-18	19 1/2	VIATRON	- 4 1/2 -18.75

COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK PERCENT CHANGE
N	172-126	129	BURROUGHS CORP	- 1 - 0.77
N	37-20	20 1/2	COLLINS RADIO	- 1 1/8 - 5.20
N	122-40	44	CONTROL DATA CORP	+ 3/4 + 1.73
A	124-84	85	DIGITAL EQUIPMENT	+ 3/8 + 0.44
N	11-5	6 5/8	ELECTRONIC ASSOC.	+ 1 +17.78
A	14-6	6 1/4	ELECTRONIC ENGINEER	- 1/2 - 7.41
N	39-30	31	FOXBORO	- 3 3/4 -10.79
O	42-13	13 1/2	GENERAL AUTOMATION	- 2 1/4 -14.29
N	77-67	71 3/8	GENERAL ELECTRIC	- 1 1/8 - 1.55
N	45-38	41 1/4	HEWLETT-PACKARD CO	+ 1 7/8 + 4.76
N	152-114	119 1/2	HONEYWELL INC	+ 4 1/4 + 3.69
N	387-296	296 3/4	IBM	-12 1/4 - 3.96
N	171-114	121	NCR	+ 1 3/8 + 1.15
N	34-23	24	RCA	- 1 - 4.00
N	33-20	23 1/2	RAYTHEON CO	+ 1/8 + 0.53
O	8-2	4 3/4	SCI. CONTROL CORP.	- 1/8 - 2.56
N	40-26	27 3/4	SPERRY RAND	- 1/4 - 0.89
A	49-24	25 1/2	SYSTEMS ENG. LABS	- 1 1/4 - 4.67
N	29-17	18 1/2	VARIAN ASSOCIATES	+ 1/4 + 1.37
A	51-28	31	WANG LABS.	- 1/8 - 0.40
N	115-81	85 1/2	XEROX CORP	+ 2 1/2 + 3.01

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9-5	6 1/4	BANISTER CONTIN	+ 1/4 + 4.17
O	25-14	14 1/2	BOOTHE COMPUTER	- 4 1/4 -22.67
O	8-4	4 3/4	BRESNAHAN COMP.	- 1/2 - 9.52
O	8-4	4 1/2	COMPUTER EXCHANGE	- 3/4 -14.29
O	18-4	5 1/2	COMPUTER LEASING	+ 1 +22.22
O	15-5	5	CYBER-TRONICS	- 2 -28.57
N	32-10	11	DATA PROC. F & G	- 2 1/4 -16.98
O	8-4	4 1/2	DATRONIC RENTAL	+ 1/4 + 5.88
A	24-14	14	DEARBORN COMPUTER	- 2 3/4 -16.42
O	8-5	6	DIEBOLD COMP. LEAS.	- 1/4 - 4.00
A	10-5	5 1/8	DPA, INC.	-----
A	22-11	11 3/8	GRANITE MGT	- 1 7/8 -14.15
A	44-6	7 3/4	GREYHOUND COMPUTER	- 1/8 -1.59
N	30-12	13 1/8	LEASCO DATA PROC.	+ 3/8 + 2.94
O	5-4	4	LECTRO COMP LEAS	- 1/8 - 3.03
A	19-4	5 1/8	LEVIN-TOWNSEND CMP	- 1 1/4 -19.61
O	3-1	1 7/8	LNC DATA, INC.	- 1/8 - 6.25
O	4-1	1 7/8	MANAGEMENT ASSIST	-----
O	8-5	6 1/2	NCC LEASING	- 1/4 - 3.70
O	8-4	4	SYSTEM CAPITAL	+ 1/4 + 6.67
A	19-12	14	U.S. LEASING	- 1/4 - 1.75

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6-3	3	ADVANCED COMP TECH	- 1/2 -14.29
A	24-4	5 3/4	APPLIED DATA RES.	+ 1 +21.05
O	18-5	6	APPLIED LOGIC	- 1/2 - 7.69
O	8-2	2	ARIES	- 1/4 -11.11
A	47-29	32 1/4	AUTOMATIC DATA PRC	+ 1 1/4 + 4.03
O	14-8	8 1/4	AUTO SCIENCES	- 1 3/4 -17.50
O	9-3	3 1/4	BRANDON APPL SYS	- 3/4 -18.75
O	3-1	1 1/4	COMPUTER AGE INDUS.	- 1/8 - 9.09
A	12-4	5	COMPUTER APPL	+ 5/8 +14.29
O	14-6	6 1/2	COMPUTER ENVIRON	- 3/4 -10.34
N T	10-3	3 3/4	COMPUTER INDUS.	- 2 -22.86
O	13-4	5 3/4	COMPUTER NETWORK	- 1 1/4 -17.86
O	15-6	9 1/2	COMP. PROPERTY	- 2 -17.39
N	34-12	13	COMPUTER SCIENCES	+ 3/8 + 2.97
O	8-5	6 1/4	COMPUTER USAGE	- 5/8 - 9.09
A	75-27	30 1/4	COMPUTING & SOFT	- 2 1/2 - 7.63
O	9-4	4 3/8	COMRESS	- 1/4 - 5.41
O	14-5	5 1/2	COMSHARE	- 1 -15.38
O	3-1	1 1/4	CONSOL. ANAL. CENT.	+ 1/8 +11.11
O	24-8	7	DATA AUTOMATION	- 2 1/4 -24.32
O	28-13	13 3/4	DATA PACKAGING	- 1/4 - 1.79
O	6-2	2 1/2	DATAMATION SERVICE	-----
O	9-5	7 1/4	DATATAB	- 1/4 - 3.33
O	4-2	2 3/4	DIGITEK	-----
O	13-7	8	EDP RESOURCES	- 1 1/4 -13.51
A	11-5	6	ELECT COMP PROG	- 3/8 - 5.88
O	161-70	70	ELECTRONIC DATA SYS.	-20 -22.22
O	20-6	7 3/4	INFORMATICS	- 3/4 - 8.82
A	25-10	11 3/4	ITEL	- 1/2 - 4.08
O	7-1	1 3/4	LEVIN-TOWNSEND SERV.	- 1/4 -12.50
A	25-15	17 1/8	MANAGEMENT DATA	+ 1 1/8 + 7.03
O	8-4	4 1/2	NAT COMP ANALYSTS	- 1/2 -10.00
O	12-3	10	NAT. COMP. SERV.	+ 1/4 + 2.56
N	54-21	22 3/4	PLANNING RESEARCH	- 1/8 - 0.55
O	27-14	14 1/2	PROGRAMMING METHODS	- 1/2 - 3.33
O	5-3	3	PROGRAMMING & SYS	- 1/4 - 7.69
O	33-7	7	PROGRAMMING SCIENCES	- 2 1/2 -26.32
N	14-4	6	SCIENTIFIC RESOURCES	+ 7/8 +17.07
O	2-1	1	SOFTWARE SYSTEMS	- 1/4 -20.00
O	3-2	---	STRATEGIC SYS	-----
O	27-9	10 1/2	TBS COMP CENT INC.	- 1 1/2 -12.50
O	4-2	3 1/2	UNITED DATA CENTER	-----
N	99-28	33 5/8	UNIVERSITY COMP.	+ 2 5/8 + 8.47
A	20-6	6 1/2	URS SYSTEMS	- 3/4 -10.34
O	13-6	6 1/4	U.S. TIME-SHARING	- 1/4 - 3.85

Earnings Reports

DPF&G

Nine Months Ended Feb. 28

	1970	a1969
Shr Ernd	\$.60	\$1.76
Revenue	39,830,583	27,168,520
Earnings	b2,193,954	5,885,841

a-Restated by company. b-After an extraordinary charge to earnings of \$2,022,348 net of tax effect (55 cents per share) and an additional charge to earnings of \$2,996,100 net of tax effect (82 cents per share) representing certain other unusual costs attributable to the Systems Division.

BECKMAN INSTRUMENTS

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	\$.37	\$.31
Revenue	34,400,000	32,500,000
Earnings	1,300,000	1,000,000
9 Mo Shr	.93	.75
Revenue	99,300,000	95,600,000
Earnings	3,200,000	2,600,000

NCC LEASING INC.

Nine Months Ended Mar. 31

	1970	a1969
Shr Ernd	\$.31	\$.16
Revenue	15,718,765	14,454,019
Earnings	414,678	203,610

a-Restated to include operations of Rudin & Roth Inc., acquired in Feb. 1970.

APPLIED MAGNETICS CORP.

Six Months Ended Mar. 31

	1970	a1969
Shr Ernd	\$.24	b\$.14
Revenue	11,880,975	8,544,576
Earnings	958,328	546,319

a-Restated. b-Adjusted to reflect two-for-one stock split in Jan. 1970.

WANG LABORATORIES INC.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	\$.10	a\$.19
Revenue	5,818,128	6,216,299
Earnings	375,379	729,446
9 Mo Shr	.39	.44
Revenue	17,162,495	15,776,778
Earnings	1,504,691	1,676,670

a-Adjusted to reflect 100% stock dividend in Nov. 1969.

WABASH MAGNETICS INC.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	\$.16	\$.14
Revenue	7,311,939	6,032,985
Earnings	279,128	242,702

VIATRON COMPUTER SYSTEMS

Three Months Ended Jan. 31

	1970	1969
Revenue	\$194,000	\$94,000
Loss	2,900,000	906,000

BOOTHE COMPUTER CORP.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	\$.43	\$.42
Revenue	10,222,000	9,034,000
Earnings	727,000	704,000

POTTER INSTRUMENT CO.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	a\$.25	\$.17
Revenue	9,755,900	8,273,531
Spec Chg	b1,038,800
Loss	355,900	1406,825
a9 Mo Shr	.65	.48
Revenue	27,200,000	21,118,218
Spec Chg	b1,038,800	c750,000
eEarnings	645,200	1,933,307

a-Based on income before special items. b-Resulting from the MAI damage settlement. c-Credit, gain on notes receivable. e-Equal to 25 cents a share in 1970 and 79 cents a share in 1969. f-Income.

TALLY CORP.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	a\$.03
Revenue	3,789,434	\$2,090,000
Tax Cred	37,500
Earnings	b84,176	d596,000

a-Based on income before tax credit. b-Equal to five cents a share. d-Loss.

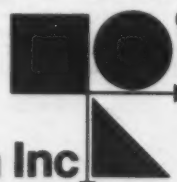
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CHICAGO ILL	312	692	7153
CINCINNATI OHIO	513	531	3060
CLEVELAND OHIO	216	331	1608
DALLAS TEX	214	638	3890
DETROIT MICH	313	875	5721
HARTFORD CONN	203	643	1597
HOUSTON TEX	713	526	3188
KANSAS CITY MO	816	753	5372
LOS ANGELES CALIF	213	826	5527
MILWAUKEE WISC	414	771	7880
MINNEAPOLIS MINN	612	333	6050
NEW YORK NY	212	986	4050
PHILADELPHIA PA	215	835	2088
PITTSBURGH PA	412	319	3439
ROCHESTER NY	716	442	0420
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